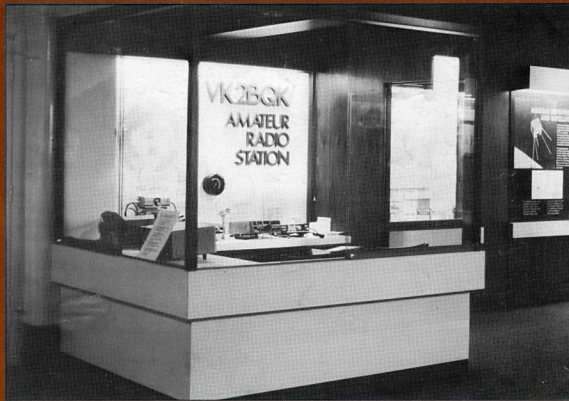


# amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA



VOL. 49, No. 9

SEPTEMBER 1981

## ***FEATURED IN THIS ISSUE:***

- ★ **A PRACTICAL BFO AND BUFFER TO OPERATE CRYSTAL CONTROLLED CB UNITS ON 10m**
- ★ **SOLAR CELLS**
- ★ **A REPORT ON THE ACTIVATION OF BURMA STATIONS XZ5A AND XZ9A**
- ★ **EXPLANATORY INFORMATION ON THE NEW METHOD FOR DESIGNATING EMISSIONS**

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# amateur radio

SEPTEMBER 1981

VOL. 49, No. 9

PRICE: \$1.30

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Caulfield North 3161.

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Typesetting: MUELLER GRAPHICS PTY. LTD.  
1a Levensall Road, Moorabbin, 3189

Tel.: 553 0292

Printers: WAVERLEY OFFSET PUBLISHING  
GROUP  
Geddes Street, Mulgrave 3170

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## Cover Photo



Radio has played a major role in Australia's development. The vastness of our land necessitated early development of long distance communications and radio broadcasting. A number of museums give considerable space to displays relating to these developments — Wireless Hill, Perth, the Melbourne Science Museum, the Telecommunications Museum, Adelaide and the Sydney and Brisbane Science Museums. Amateur Radio has a special place in some of the museum displays. This photograph shows the Amateur Station at the Sydney Science Museum.

(Photo from Chris Long)

**QSP —**

Dear Sir,

Through the pages of your journal, I would like to thank all the amateurs who provided invaluable assistance to the Australian Coastal Surveillance Centre on the night of the 20th June. For those who have never heard of it, the Australian Coastal Surveillance Centre (formerly the Marine Operations Centre) is the Commonwealth Government's Marine Search and Rescue Authority. We are responsible for the largest marine SAR area in the world — half way to Africa, half way to New Zealand, south to Antarctica and north to the PNG/Indonesian islands chain. We operate 24 hours per day throughout the year, are staffed by professional mariners and were involved in 1564 SAR incidents last year.

On the night of the 20th June the yacht "Lady Johanna" caught fire whilst in the vicinity of Willis Island, some 450 km east of Cairns. The skipper broadcast a distress call on 14.332 MHz and within a very few minutes our phones were ringing with reports from all over Australia and relayed reports from New Zealand, Canada and the USA. Shortly afterwards the fire was extinguished and the distress call was cancelled, this too was relayed to us instantly.

It was a great effort on the part of amateur radio operators and only the most recent example of the excellent assistance you have provided over a long period of time. Whilst the incident is still fresh in our memories I would like to take the opportunity of suggesting a few ways of improving your co-operation even more.

When a distress call is received from a marine craft either phone the police or make a **reverse** charge call to us in Canberra (062) 47,5244. Don't hesitate to make it a reverse charge call for during the "Lady Johanna" incident we kept the phone line open for quite a long time and we don't want you worrying about your STD bill!

If there are several of you on the circuit when a distress call is heard, try and decide (briefly) between yourselves as to who will phone us — a minor problem the other night was that though we have five dedicated SAR phones, there were only four of us on duty and the calls were coming thick and fast.

Bear in mind that in a distress situation the boat skipper is under tremendous pressure, is probably frightened (I speak from experience) and may well be in a bit of a panic. A calm voice (yours) at the other end can be very reassuring. Don't badger the skipper; you should listen a lot and not say very much, but do try and obtain the following information:—

NAME      POSITION      NATURE      NUMBER

NAME of the craft, call sign (official and/or amateur)

POSTITION

NATURE of the distress situation

NUMBER of persons on board

then if there is time, a description of the craft, its safety equipment and any other information would be most useful to us. If possible make a tape recording of the communications, in the heat of the moment you might forget exactly what was said and it is very useful to be able to play back.

If you receive a distress call from any source outside Australia's area of responsibility, say from the USA, Asia or Europe, then please phone us. We will discuss the report with you and then immediately pass it on to the appropriate overseas SAR authority.

Once again, our sincere thanks to you all for your most recent effort.

Yours faithfully,

J. P. BARR, Controller,  
Australian Coastal Surveillance Centre. ■

# Letter from Transport Australia



"Lady Johanna" — PA2RNM/MM

Mr. and Mrs. Noordermeer and family  
coming ashore at Cairns from the rescue  
vessel "Jenny" of Freeport, Indonesia.



# WIANEWS

## PORTABLE REPEATERS

The conditions relating to the operation of portable WICEN repeaters have now been accepted — see AR March 1981, page 7.

## CBRS

During July the Minister for Communications issued a media release on the CB Inquiry which he said should become available for further public comment towards the end of August. He listed the six key recommendations. Amongst these are:—expansion from 18 to 40 channels on 27 MHz, maintenance of 'short distance' concept of the CBRS for communications within Australia (though in some ionospheric conditions it was possible for CB communications to extend overseas — but this, he said, was not intended) and permission for one-hop UHF repeaters (a Committee to be set up to work out conditions).

## CABLE TV

In July last year the Australian Broadcasting Tribunal announced an Inquiry into Cable and Subscription TV Services and matters relating thereto. The Institute made a submission inviting the Inquiry to bear in mind the possibility of interference if common frequencies were used and urged the Inquiry to recommend that frequencies used by cable TV be those not allocated to the amateur or other services that are likely to operate transmitters distributed throughout residential areas.

In May 1981 the Tribunal announced that the terms of reference of the Inquiry had been expanded to include a more detailed consideration of radiated subscription TV services and consequently extended the date for receiving further written comment. The Federal Technical Advisory Committee has prepared a further draft submission.

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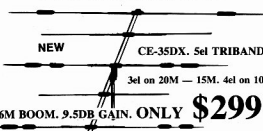
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(4el 10M 4el 15M)	

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# WIA NEWS

## CALL BOOK 1981/82

This year's Call Book shows promise of being a bumper issue full of reference material — much more than in the 1979 issue. At the time of closing copy all the repeater and similar details were expanded and up-dated. It was disappointing that many clubs (etc.) failed to send in their own details, but even so, the clubs listing is reasonably comprehensive. On the other hand, the Federal Managers and Co-ordinators did a splendid job, as you will see when the Call Book comes out. The call sign listings

this year were more up-to-date than in any previous year, thanks to the Department of Communications and the response of individuals. The book should be available from your Division by the time you read this — cover price \$3.95, but if you want it posted add postage for the "250 to 500 gram other articles" rate when ordering from your Division or direct from Magpubs. Last year the Call Book was already sold out when it was distributed, so the print run for this issue has been moderately increased. ■

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**President** — Mr. A. D. Tilley VK2BAO  
**Secretary** — Ms. S. J. Brown VK2BSB  
**Broadcasts** — 1100 local 1.02Z, 144.12, 3.595, 7.146, 28.32, 52.12, 52.575, MHz. Rptr. Ch. 6650 Oberon, 6750 Orange, 6750 Gosford, 6800 Lismore, 7000 Sydney, 8525 Sydney.  
**1930 local** 52.12, 52.525, 144.12 MHz. Rptr. Ch. 6650 Oberon, 6750 Gosford, 7000 Sydney, 8525 Sydney. Relays on 1600, 80 and 10 metres.

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**Gen Mgt** — 2nd Wed., 20.00

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**President** — Mr. D. Laurie VK4DT  
**Secretary** — Mr. A. J. Aarssse VK4QA  
**Broadcasts** — 1.825, 3.580, 7.120, 14.342, 21.175, 28.400, Rpt. Ch. 8700 and 7000 Sundays from 0900Z (Sat. 2300 UTC).  
**Re-broadcasts** — Mondays 3.605 from 1930Z, Mondays 80 or 20m RTTY segment from 200Z.

### SA:

**President** — Mr. J. B. Mitchell VK5JM  
**Secretary** — Mr. W. M. Wardrop VK5AWM  
**Broadcasts** — 1820, 3550, 7095, 14175 kHz; 21.195, 28.470 and 53.1 MHz, 2m (Ch. 8): 09.00 S.A.T.  
**Gen. Mgt.** — 4th Tuesday, 19.30.

### WA:

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**Broadcasts** — 3560, 7075, 14100, 14175 kHz; 28.47, 53.1 MHz, 2 metres Ch. 2 Perth, Ch. 6 Wagin. Time 0130Z.  
**Gen. Mgt.** — 3rd Tuesday.

### TAS:

**President** — Mr. I. F. Ling VK7XL  
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**Broadcasts** — 7130 (SSB) kHz with relays on 6 and 2m Ch. 2 (S), Ch. 8 (N), Ch. 3 (NW), 09.30 EST.

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VK6 — G.P.O. Box 10, W. Perth, 6005.  
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VK3 — Inwards QSL Bureau, Mr. B. Gray VK3BYK, 1 Amery Street, Ashburton, Vic. 3147.  
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VK4 — QSL Officer, G.P.O. Box 538, Brisbane, Qld., 4001.  
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VK8 — QSL Bureau, C/- VK8HA, P.O. Box 1418, Darwin, N.T. 5794.  
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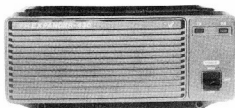
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# A Practical VFO and Buffer to operate Crystal Controlled CB Units on 10 m

Norm Hird VK6NKR  
80 Verna Street, Gosnells, W.A. 6110

I became a "ham" on the 30th Jan., 1980, using a Pearce-Simpson Bengal unit with VFO control only. I have been asked many times about the VFO which I built, and promised to publish it in Amateur Radio as soon as I was satisfied with its performance. Now I can satisfy all those who are waiting for the information.

The oscillator is a Hartley type using a FET with only 12 per cent feedback which keeps the drift very low. The tuning circuit is different from most circuits as it is series-padded.

$$C_{\text{total}} = \frac{1}{\frac{1}{C_1} + \frac{1}{C_2 + C_3}}$$

Where  $C_1$  = series paddler.  
 $C_2$  = variable capacitor.  
 $C_3$  = fixed shunt capacitor.

Bear in mind you will only require a few pF swing to cover the frequency you wish to use, i.e. 8.400 to 8.650 MHz. The main tuning capacitor used is a 10 to 415 pF small single gang type (Roblan). All capacitors should be polystyrene or NPO; silver mica types can be used as third choice. These all have low temperature coefficients keeping drift small and warm-up time short.

The cap in parallel with the tuning gang must be large and the series cap small so the swing in  $C$  is small. When considering the  $L$  and  $C$  of the oscillator, it is best to make the  $L$  large and the  $C$  small, as this also affects drift.

After finding what frequency is needed, the  $L$  and  $C$  can be calculated from the following formulas:—

$$\frac{25330.154}{f^2 C \text{ or } L} = L \text{ or } C,$$

and with a combination of  $L$  and  $C$  use this formula:—

$$\frac{159.1545}{\sqrt{LC}} = f \text{ (MHz)}$$

$C$  in pF,  $L$  in microhenries ( $\mu\text{H}$ )

And to find the number of turns of the inductance, Wheeler's Formula can be used from the ARRL Handbook, as follows:—

$$\sqrt{\frac{(9a) + (10b)}{a^2}} = N \text{ (turns)}$$

where  $a$  and  $b$  are coil radius and length (in inches).

These are all the formulae needed to calculate the tuning circuit of the oscillator, but do not forget the bandset trimmer cap.

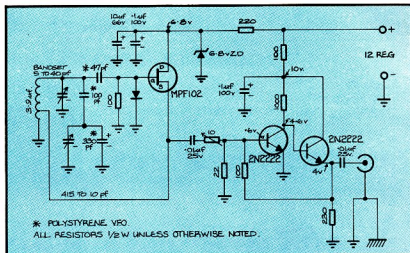


FIGURE 1

The tap of the coil is at 12 per cent from the earth end of the coil. DO NOT slug the coil as this will cause drift, and is the reason for the bandset trimmer. The coupling cap should be as small as possible to reduce detuning effects on the  $L$  and  $C$ , but not too small, causing the FET to oscillate weakly or not at all. The gate leak resistance must be high enough to have very little loading effect and the diode is to control positive sine wave on the gate. It acts as a clamp keeping the junction from heating up, which will affect the internal capacitance of the FET. The drain is RF grounded, but the DC supply must be regulated and between 4.5 and 6.8 volts. The output is taken from the source, via a coupling capacitor which can be from .01  $\mu\text{F}$  to 560 pF.

As can be seen there are many parts in the oscillator circuit, but care must be taken when building this section of the VFO. Keep all leads short as possible and the mounting of the tuning condenser rigid. More of this later.

The coupling capacitor feeds a building-out resistance which is a trim pot for adjusting drive and load from oscillator to buffer. If loading of the oscillator is heavy the base resistors can be changed to reduce it. In the first buffer circuit built the base divider used 10k and 2.2k, but these have now been increased by ten times. Two things change, the base current is reduced and the input impedance is increased, thereby reducing the load to oscillator. The base voltage of the first transistor is around 0.7 volt and on the collector about 4.6 volts, connected directly to the base

of the second transistor. The collector load of the first transistor is 1000 ohms fed from the 12 volts supply via 100 ohms and a 0.1  $\mu\text{F}$  bypass cap. The collector of the second transistor is connected to this point, where there should be around 10 volts (see circuit). The emitter of the second transistor goes to earth via 330 ohms and provides the DC feed to the base of the first transistor as well as the RF output which is via a 0.01  $\mu\text{F}$  cap. The emitter DC is around 4 volts. The RF output voltage, depending on the amount of drive required, can be set by the trim pot. Both VFO and buffers may use one PCB, but care and time must be taken when working out the layout.

## POWER SUPPLY

The VFO/Buffer must have its own power supply and regulator set for 12 volts. The current drain is less than 20 mA, so a small current power transformer will do the job well as long as it can supply 15 volts AC. A full wave bridge rectifier should be used filtered by not less than 1000  $\mu\text{F}$  at 25 volts working. The regulator is a simple circuit, using a 12.7 volt zener diode and a 2N3055 transistor. The regulator circuit must be on a separate PCB.

All earths are at one point, at the coax output socket only for chassis earth. The tuning gang must be insulated from the chassis and its earth returned to the PCB close to the oscillator circuitry, i.e. the earth point of the coil.

Both of the PCBs, tuning gang and power transformer are mounted on a chassis which is attached to a panel which is the

front plate. Holes may be cut in the chassis for the PCB mounting. No extra shielding is required as the cabinet will be sufficient. Mount the tuning gang as close as possible to the VFO section of the PCB and make sure the mounting is rigid. Remember it cannot be too rigid!

All the calculations have been left to you to work out as not everyone has a Pearce-Simpson Bengal, but it must be a crystal-controlled set and not a PLL type.

Now a run-down on how the Pearce-Simpson was put on 10 metres. Remove the 10 kHz spaced crystals (6) and the 20 kHz spaced crystals (2) and then move a RFC to the foil side of the PCB and add a tag strip. Change to DC supply wiring and add a DPDT toggle switch and coax socket, plus three small lengths of coax. Study of the circuit of the unit shows it can now be made to operate on VFO or crystal. Most sets can be modified this way, but possibly some cannot.

#### CALCULATIONS

It was found that the frequency required is 8.4938 MHz to 8.7438 MHz. The calculations gave 3.9 uH and 90 pF at 8.4938 and 85 pF at 8.7438, a swing of 5 pF required. Calculations show that the values given on the circuit will give rather more than this capacitance swing assuming the bandset to be at about 30 pF. Thus the de-

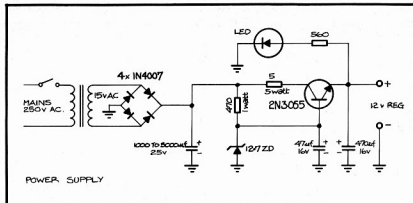


FIGURE 2

sired frequency range is adequately covered.

Now for the coil. What are the number of turns needed and  $l/d$ ? Assume former diameter  $1\frac{1}{4}$  inch and winding length  $\frac{1}{2}$  inch. Now, with Wheeler's Formula, you should get these figures.

Coil radius  $a = 0.125$  and  $a^2 = .015625$ . The length of the winding  $b = 0.5$ , so  $9a + 10b = 6.125$ , divided by  $a^2 = 392$ , then  $392 \times 3.9 = 1530$ . Now find the

square root of 1530 = 39.1 turns. 12 per cent is 4.7 turns, which is the tap on the coil. In practice 39 turns in  $\frac{1}{2}$  inch tapped at 4 turns is close enough, giving less than 3.9 uH, but remember the band set trimmer condenser will correct the oscillator's frequency. The most important thing is patience. Don't be in a hurry or try to short cut, it does not work and brings disappointment. Good luck with your project!

## Visiting a Ham...

John VK2ATT

In "The Lyrebird", Issue No. 14, Autumn 1981

Do not write or ring first; this gives him time to think up a refusal—just call round. Knock up a spot of CW on the bell push; it may wake the baby but why should you worry? (You cannot be expected to know that the bat's only just gone to sleep.) When he opens the door say "73", just like that. It is possible to get an idea at this stage how good a ham he is—he may say "Good evening" and at one strike give himself away for a lid. Should he be a dyed-in-the-wool ham with all the gen, he will immediately say "88". Then introduce yourself and step in, asking him the way to the shack. Precede him all the way if you can guess where he keeps his gear; this will give you a large measure of moral superiority and is well worth the risk of wandering into the wrong room. Once in the operating room (sorry—shack) you should immediately sit yourself in the operating chair, tilting it on its back legs and surveying the gear the while. If you can get a mildly surprised look on your face then it is permissible to say "Nice little place you have here", if not say "Hm".

At this stage a strong line is to begin looking for the Tx main switch, remarking how inaccessible it is. Then switch on. Good manners are shown by asking the

owner before actually calling, but do not be put off by his mumbles about "TVI" and "After 8.20"; tell him he must be firm with the neighbours—then get on the air and call CQ. Phone of course; it is only beginners who have to use the key. Let him know that you can send at 30s and that you have not bothered to learn receiving as you do not intend to use CW anyway when you get your ticket. (Here comes a good opportunity to tell him what call you are going to ask for from the DOC.) If by this time he has managed to fight his way to the transmitter and switched it off, turn your attention to his auxiliary gear. Should he be tuning his receiver, it does not require a great deal of elbow work to get at it yourself. All the better if it has carefully adjusted flywheel tuning. Give the dial a good hearty spin; the stop should be made solid enough to stand the bump. You might mention here the various disadvantages of his particular receiver. If he has a frequency meter, then give that a look over. In case the xtal does not oscillate, give the case a bang on the bench; that is also a good test of the frequency stability. The ham you have favoured with your visit will also be immediately grateful when you tell him his receiver is out of alignment—take a look inside and ask him for the trimming tools. You know exactly how easy it is to

trim the thing on a signal. Not for one moment can you hope for the trimming tools to be forthcoming, hams are awkward people, but do not be dismayed, a small screwdriver or a penknife blade will do the trick. When the instrument is working to your satisfaction, the time should be about 11.30 p.m. This is the moment to ask him for his QSL card and exchange it with one of your own. The more livid your own card is, so much the better. What may appear to be a wince on his face is only chagrin at the poor showing his own card is making. It is as well to mention that you do not get your cards from the printer mentioned on his cards—their printing is so lousy. Your own card can be one that you have already filled up to send to another "G"—don't waste a new card on him. Then, do not overstay your welcome. Make your way to the front door and stand just outside for half an hour or so. It always adds to the pleasurable feeling you leave behind if you can start an argument—in a loud voice of course. Take no notice of windows opening and closing in the neighbouring houses. They are not your neighbours anyway. As you proceed down the garden path shout "73 OM" and "88 to the XYL" together with a promise to come again soon. You can be sure he will look forward to your next visit.

# Solar Cells

By Robert Ravensberg ZS1FF  
(From Radio 25, November 1980)

## FABRICATION

Most solar cells available today are essentially P-N diodes whose photo-voltaic characteristics have been optimized. A solar cell has a very simple structure as shown in Fig. 1.

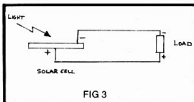


FIG 3

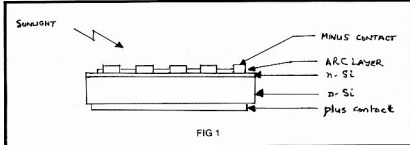


FIG 1

Each cell is comprised of a very thin slice (0.3 mm) of positive doped silicon (p-Si) underneath a layer of negative doped silicon (n-Si). The square blocks (Fig. 1) are cross sections of the negative metal contact "fingers". The number of fingers and their thickness is a compromise between the width of the metal (obstruction of light) and the series resistance. In order to reduce the losses due to reflections, an anti-reflective coating ("ARC") is sprayed between the "fingers". The light therefore falls directly on to the cell. The positive reverse side of each cell is completely covered by a layer of metal which does not allow light to pass through it.

## EFFICIENCY

In full sunlight (approximately 100W per square metre) a solar cell typically delivers 25 mA per square centimetre at a voltage of 0.5V. This is 125W per square metre. The efficiency is therefore 12.5 per cent. The theoretical maximum is around 20 per cent. Higher voltages are obtained by placing a number of the cells in series. Normally one can get standard solar cell panels of 3V, 6V, 12V, 24V... with currents of 150 mA, 300 mA, 600 mA and 1.2A, etc.

Most manufacturers of solar panels give the ratings in "peak" power. This is the maximum power obtainable under optimum conditions. The average power capacity, however, is determined by the actual location of the solar cell.

The efficiency of solar cells is temperature dependent, with more power being generated at lower temperatures. This offsets some of the losses experienced during the shorter solar days in winter. The electrical data for a typical solar panel is shown in Table 1 (courtesy of AEG-Telefunken type PQ 5/40/0 solar generator).

## OPERATING COSTS

For solar panels of 20W peak power or more the average cost at the moment in South Africa is between R20 and R30 per peak watt. (R1.00 equals \$1.06 approx.) Prices vary considerably between the different manufacturers.

If the average solar radiation intensity for South Africa is 2000 kWh/m<sup>2</sup> per annum, and assuming a typical efficiency of 12 per cent only 240 kWh/m<sup>2</sup> is available per annum. From this an operating cost of 50c per kWh is obtained, which is about 8-12 times greater than the mains generating cost at present. The solar panel lifespan was taken as 20 years and 3 of Motorola type MSP 43A 40 40W solar panels at R800 each were assumed. No

account was taken of the fact that a storage battery would probably be required.

The cost/kWh could be considerably reduced by keeping the cells orientated in the correct position. This, however, would involve other costs, e.g. sun tracking equipment costs.

An interesting fact is that the present generation of solar cells apparently consume more energy during the manufacturing process than they can produce in their entire lifespan ("Negative energy conservation"). Ideally a solar cell "factory" should derive all its power from solar cells.

## STORAGE DEVICES

A battery of some type is almost always used. The capacity must be large enough to carry the system through extended periods of poor weather. Battery capacity is relatively independent of array size.

High capacity lead acid automotive batteries should be avoided, since they are designed to provide large amounts of current for short periods of time. High leakage currents occur in this type of design on account of their low internal impedance. Gelled electrolyte or lead-calcium batteries are a better choice. Nickel cadmiums are not recommended on account of their temperature characteristics.

Care must be taken to ensure that the battery is not damaged by excess charge. A simple voltage regulator was described in Ham Radio Magazine, December, 1976 (courtesy Solar Power Corp.). See Fig. 4.

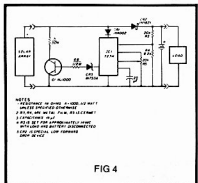
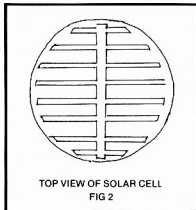


FIG 4

## INSTALLATION

Proper orientation of a solar panel is required to provide maximum power output throughout the year. Peak output occurs when the sun's rays are at normal incidence to the plane of the solar panel/array. To obtain maximum output, the array is orientated true North and inclined from the horizontal to an angle approximately equal to the latitude at which the solar panel is located.



## OPERATION

The principle of operation can be briefly explained as follows: The light causes electrons to be released when it comes into contact with the silicon atoms in a cell. These "free" electrons in the p-Si are attracted to the n-Si and thus the "finger" contacts. By placing a load across the + and - terminals a path for the electrons is established (see Fig. 3).



In principle a solar panel does not require maintenance. However, air pollution could be a problem in some installations. Physical shocks to the panel should be avoided.

#### ELECTRICAL DATA

Characteristic values  
(AM1 - 100 mW/cm<sup>2</sup>)

	Operating temp.		
	0°C	25°C	60°C
Open-circuit voltage (V)	23.9	21.7	18.6
Short circuit current (mA)	582	591	603
Current at maximum power (mA)	534	539	547
Max. Power (W)	10.4	9.4	7.9

Voltage, current and power data as a function of temperature:

Voltage —

increases below  
decreases by 0.41%/°C above 25°C

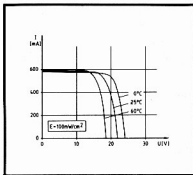
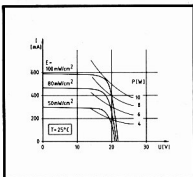
Current —

increases above  
decreases by 0.06%/°C below 25°C

Power —

increases below  
decreases by 0.44%/°C above 25°C

#### CURRENT/VOLTAGE CHARACTERISTICS



#### FUTURE DEVELOPMENTS

Since the advent of the first solar cells produced in 1954 by Bell Laboratories, there has been considerable progress in the development of more efficient and cost-effective cells. Approximately 10,000m<sup>2</sup> of solar cells were produced in 1978, which, when operating at a conversion efficiency of 10 per cent could produce about one million peak watts from solar energy. The greatest effort in research and development has been placed on silicon, largely because of its availability, being the second most plentiful element in the earth's crust. According to an article in Design Engineering (June 1980) Westinghouse has developed a new process in which silicon is produced automatically in the form of a continuous ribbon or web of material (which they call a "silicon dendritic web"). Thanks to this new process the era of low-cost silicon cell solar arrays is in sight. Although the development is still in its early stages, they expect to go a long way towards meeting the United States Department of Energy's (DOE) goal of 50 US c per peak watt by 1986.

#### ACKNOWLEDGEMENTS

1. Electron, February 1980, p. 81-83.
2. Ram Radio, December 1978, p. 28-33.
3. AEG-Telefunken Solar Generator data sheet.
4. Design Engineering, June 1980.

## Post World War II Army Radio Set

I. J. Connell VK8CO  
Box 40441, Casuarina, NT 5792

The A510 wireless set is a lightweight, manpack transmitter-receiver for operation principally by long range infantry patrols. It has facilities for either voice or CW.

The specifications are listed below:—

Antennae: 8 ft. rod, adjustable dipole, 135 ft. end fed with counterpoise.

Power supply: Consisted of two dry batteries, HT—90/7½ volts, LT—1½ volts.

Battery life: 14 hrs. at a 1:5 send/receive ratio.

Power output: Voice 0.15 watts, CW 0.5 watts.

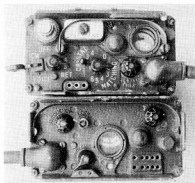
Weight: 22 lb., including batteries.

Frequency range: Crystal locked 2-10 MHz.

The receiver is a conventional 5 valve reflexed superheterodyne with one stage of tuned RF amplification. There is sufficient power output to drive two pairs of headphones in parallel.

Netting is obtained independently of the distant station simply by tuning the receiver to zero beat against the transmit crystal.

The transmitter is a four valve crystal oscillator grid modulated power amplifier transmitter.



The Rx and Tx were carried on the front of the web belt and tied around the chest. It was comfortable once one became used to it, but the "getting used to" stage always tended to rub a lot of skin off the hips.

One compensation in carrying this radio was the tunable Rx. Many a pleasant hour was spent lying in the bush listening to the ABC or Radio Australia. It was notorious for drifting off frequency and had to be checked often.

Today the batteries are impossible to obtain even from Eveready USA, but it should be possible to build an AC supply or even an inverter into the base of the transmitter to enable it to run from 12 volts.

I remember this radio with a certain amount of affection as it was these experiences that led me to Amateur Radio. The set proved reliable and by careful antenna design, respectable distances could be worked. One obtained a great feeling of achievement when contact was made, be it ever so weak.

The station comes in a transmit box with the following CES:—

- 2 pouches, carrying; 2 aeriels, flexible, 8 ft.; 1 inductor tuning, 8 ft. flexible aerial; 1 telephone handset; 1 case, carrying, flexible aerial; 1 aerial, end fed, adjustable, 135 ft.; 1 counterpoise; 2 cords, aerial, weighted; 1 feeder, aerial, 70 ohm; 2 aeriels, lightweight, 68 ft. (dipole); 1 microphone and receiver headgear assy.; 1 key, CW; 1 satchel, signals; 1 chart instruction; 1 user handbook; spare lamps, crystals.

#### SUPPORT OUR ADVERTISERS!

# How the Other Half lives — Two Metres in Asiatic Russia

Very little information is published on the activities of amateurs in Asiatic Russia — UA0 land. The following information appeared in the Russian journal "Radio" late last year and should be of interest to two metre operators in Region 3.

"With the Ultrashortwaves of the 0 Call Area", by S. Bubennikov, Master of Sport of the USSR. (Translator's note: S. Bubennikov UK3DDB writes the VHF/UHF/SHF (VHF/UHF/SHF is ultrashortwave in Soviet amateur parlance) column in "CQ-U"). In recent years Soviet amateurs have been successfully bringing into use the ultrashortwave bands, and there are practically no blank spots left in the European part of the country. Centres of activity are springing up in Siberia and the Far East as well — in particular on Sakhalin and on the Eastern seaboard. The development of ultrashortwave has proven to be no simple matter, due to the fact that there are not all that many amateur stations in the area and due to the very significant distances between stations. The first ultrashortwave contacts in the Far East took place within cities. Only in 1977 did a group of hams from Sakhalin — G. Korenchenko UA0FAM, A. Leont'yev UW0FZ, N. Shchelokov UA0FBE, A. Lubenets UW0FM — try.

DX QSOs. G. Korenchenko led the way, contacting JA8UA. This inspired others, and soon JA8 became a common prefix in Sakhalin hams' logs. These were regular tropospheric QSOs. The Es-propagation season brought new success to the Sakhalin hams, who succeeded in working most of the call areas of Japan. And this was not easy, as many Japanese ultrashortwave operators do not know telegraphy and have a very poor command of the English language. The next big step was the establishment of a beacon, UK0FAI, operating around the clock and assisting in the tuning of equipment and in determining propagation conditions. The beacon helped in setting up DX tropo contacts with Japanese stations. But in the course of two years of intensive operation ultrashortwave enthusiasts only achieved a distance of 450 km. (This apparently refers to monitoring of the beacon. Translator.) Was this because of mountainous terrain? But why were the signals from the beacon received two S-units stronger in Japan than by anyone from among the local ultrashortwave operators? Photographs of the antennas of Japanese stations provided the answer. They had vertical radiators in contrast to our horizontal ones, and the UK0FAI beacon antenna had vertical polarization. The conclusion was to change the position of the antenna during tropo propagation. But why was everything normal during Es-propagation? The reason is that during Es-propagation antenna polarization is not so

significant since the polarization of a radiowave can change, for example from vertical to horizontal.

The ultrashortwave operators from the Eastern coastal area had a harder time making QSOs with Japanese stations, which is natural since there are about 700 km between Vladivostok and the nearest stations in Japan. The Far East coastal hams are planning to conduct DX tropo QSOs with the cities of Ussuriysk and Arsen'yev.

Many have already had Es-QSOs with JA. A. Serba RA0LAN, the brothers V. Shchelkunov and B. Shchelkunov RA0LKF and RA0LFI, A. Zorin UA0NL and A. Grigor'yev RA0LCM have worked all Japanese call areas. When I was in Vladivostok, I met A. Prokolov UA0CCO, Chairman of the Radio Sport Federation of Khabarovsk Krai. He related that the first steps toward the opening up of ultrashortwave have been taken in Khabarovsk, that UA0CAA, UA0CBO, UA0CAF and RA0CCM are communicating within the city, and that attempts are being made to establish DX contacts between Khabarovsk and Birobidzhan. In general, the plans of the Far Easterners are vast, and include establishment of meteor contacts with Siberia, opening up 430 MHz and establishing a network of ultrashortwave stations all over the Far East. Plans are to get work going in Kholmsk, Petropavlovsk-Kamchatskiy, Magadan, Okhsa, Komsomol'sk-na-Amure, Sovetskaya Gavan', Vanino, Khabarovsk, Birobidzhan, Blagoveshchensk, Ussuriysk, and Artem. In a number of cities ultrashortwave operators are already preparing to go on the air.

## CHRONICLE

More than two years ago the beacon UK0FAI in the city of Yuzhno-Sakhal went on the air. It transmits on 144.090 MHz, giving its call sign and then 15 seconds of carrier frequency. Five watts of power and a non-directional, vertically-polarized antenna are used. . . . Recently another beacon appeared in Primorsky-Krai — UK0LAS, operating from the city of Arsen'yev on 144.990 MHz and also transmitting its call sign and a 15 second carrier. Its power is 4 watts and its antenna is non-directional with horizontal polarization.



Submitted to AR by D. H. Rankin  
9V1RH/VK3QV  
Secretary IARU Region 3 Association

The following article appeared in the USSR publication "Radio", No. 10 of 1980. It gives a very interesting insight into how the major USSR contest stations are set up. Dex Anderson K3KWJ provided the summary translation.

D. H. Rankin 9V1RH/VK3QV

"Two Years on Expedition", by V. Uzun UB5MCI, Master of Sport of the USSR. In major international contests the battle for first place is often waged between stations with special call signs that have gone out on expedition for the period of the contest. The present article describes two expeditions, organized by the Voroshilovgrad Radio Sport Federation in 1978 and 1979 for participation in the CQ WW DX Contests, in the category collective station with one transmitter. Both times the expedition went to the settlement of Kodzhori, near Tbilisi (Georgian SSR), situated at an altitude of about 1500 metres above sea level. In 1978, using call sign RF6F, the collective took second place in the world on phone (4900 QSOs, 7.4 million points) and first place on CW (4260 QSOs, 5.9 million points). The 1979 results are not yet confirmed, but the operators of RF6F (the 1979 call sign) did significantly better with 9,000,000 points on SSB and 8,000,000 on CW, so high places can be counted on. How were these results achieved? First of all, it should be noted that plans for carrying out radio expeditions had been brewing for many years and that preparations began a year before the date of the contest concerned. This was not an undertaking of some isolated group of operators, but a planned activity of the oblast' RSF, supported by the DOSAAF oblast' committee, the Central Committee of the Ukrainian DOSAAF, and the Radio Sport Federation of the USSR. A wide range of matters had to be decided upon: Selection of a site, the make-up of the team, permission to use a special call sign, preparation of equipment and antennas, financial arrangements and vehicles, and training of the operators.

Why was Georgia picked? Simply because it is the nearest part of Asia to Europe, and according to the contest rules a contact from Asia to other continents counts 3 points; the large quantity of stations in Europe and the triple count of points for working them was one of the decisive factors in the success of the operation. The choice of the specific location was occasioned by its excellent topographic situation and the availability of commercial electricity and convenient

buildings and antenna sites. The team in both cases was composed of the best operators of the oblast, chosen on the basis of the sport experience, the stability of their scores, and their active volunteer work. The backbone of the collective consisted of UY5LKL, UB5MCD, UB5MDC, UB5MNM, UB5MOA, and others — 12 to 17 persons in all. All were masters of sport of the USSR. The organizer and chief of the expedition from beginning to end was the chief of the Voroshilovgrad DOSAAF Radio Technical School, I. Kupershmidt UB5EC, meritorious trainer of the Ukrainian SSR. The Radio Sport Federation of the Georgian SSR agreed to the expedition and provided assistance of any kind; the most active of the Georgian shortwaveers was R. Maniya UF6HV.

The training plan for the operators included participation, up to the limits of their ability, in all major contests throughout the year; under the guidance of the most experienced operators, the trainees developed or strengthened on-the-air operating speed.

To provide back-up, the expedition carried along a dual set of equipment: Several transceivers, two R1250M2 receivers with the transceiver accessory, several output and other auxiliary pieces of equipment, keys, compressors, etc. Only vacuum-tube equipment was included on account of its superior reliability compared to transistorized. Prior to leaving on the expedition about 50,000 contacts were made using this equipment. The schematics of the R-250 receivers and electromechanical filters were installed in the IF circuit. A preselector with a Q-multiplier was used at the input. The transmitted signal was compressed.

The greatest amount of attention was devoted to antennas. There were two separate antennas for each high-frequency band and three for each low-frequency band (for 160m, only a dipole). In all there were 13 antennas, making use of 10 masts including one disassembleable one 30 metres in height. Each of the high-frequency antennas was a 3- to 6-element beam with a remote beam-heading control. Of the low-frequency antennas, the following proved to be the most effective:—

A 3.5 MHz vertical, a 3.5 MHz pyramid, and a 7 MHz beam consisting of 3 verticals. The last of these antennas proved amazingly effective when the distance between stations exceeded that of one hop. Using this antenna, 1100 QSOs were made in the 1978 contest. A similar antenna can be used on 3.5 and 1.8 MHz. To shorten somewhat the dimensions of the verticals and the systems formed from them, approximately a quarter-wave portion should be made from the loop vibrators, leaving a large distance between the sides of the loop. All the antennas were prepared and tuned before departure, so that only assembly and checkout were necessary on site.

The radio expedition was housed in a building of a pioneer camp. Aside from

equipment and antenna measuring equipment, instruments, radio parts, wire and cable, stoves for preparing food and for heating and a supply of food, were brought to the camp. All of this, weighing several tons, was brought to Kodzhori in two trucks. The equipment and the sportsmen arrived in Kodzhori a week before the beginning of the contests.

Regarding organizational aspects of the operation, first of all safety precautions were observed in the strictest fashion. All equipment and all of the operators were divided into two groups: Basic and multiplier-hunting. The groups were placed at opposite ends of the building about 40 metres apart and used a field telephone to communicate. The basic groups tried to make as many contacts as possible. Operators spelled each other at two-hour intervals, a procedure that fully justified itself and enabled them to make up to 180 QSOs an hour. How can such a rate be attained? First of all by keeping QSOs as short as possible, by being able to pick out a station quickly from the mass of stations calling, by hearing and remembering its call sign from the beginning to the end of the QSO, and also by making log entries right during the QSO. Log entries should be kept at a minimum and should consist of three columns: Time (only the minutes and an entry only at the beginning of each minute), call sign of the station worked, and the control number received (which is written down only if it differs from 599 or if it is transmitted by a station in a territory divided into several zones. You can't let up during operation and permit pauses. It's necessary to be able to hear and remember several call signs at once.

The choice of bands was based on propagation predictions made beforehand, with corrections being made in the course of operation. Band-changing took only a few seconds at the basic position.

The multiplier-hunting position had had separate equipment and antennas for all bands needed at the particular time, so there was no need for band-switching. There was a separate operator at each position. The excellent organization of the multiplier-hunting position to a great extent accounted for the successful results of the expedition. Special attention was directed toward the search for multipliers on the lower-frequency bands. Thus, on the 3.5 MHz band it was possible to accumulate up to 23 zones and 65 countries. This was made possible by a knowledge of propagation theory that permitted calculation, within  $\pm 15$  minutes, of the optimal time for contact with a given territory. Thanks to this, contact on this difficult band was as a rule established on the first call. In addition, use was made of methods such as split-frequency operation on 160, 80 and 40 metres and QSYing from the higher-frequency to the lower-frequency bands by agreement with the other station (for multiplier credit).

Co-ordination between the two positions was performed by a special secretary-dispatcher. A running multiplier count was maintained at the basic position by the secretary-dispatcher and at the multiplier position by the operators on duty. To give a general idea of how well the operation was going, totals were tallied every hour. There were two logs for each band. Repeat contacts were crossed out when doing the totals.

In coming to a realistic conclusion about the results achieved, it should be noted that, in the first place, they had special permission to use the additional frequency 3795 kHz and, in the second place, they had permission to use increased transmitter power on all bands except 160 metres. It should also be borne in mind that all of the operators had many years of experience in sport competition on the air and had earlier been victors or prize-winners many times in various competitions.

Moral qualities and willpower were emphasized in the training. Just how important this aspect was is shown by something that occurred in 1979. At 2100 MSK, before the start of the contest, a wind blew up unexpectedly with hurricane force, cutting wires and plunging the camp into darkness. Around midnight the wind reached such force that it tore off roofing and blew glass out of windows. There followed a devastating gust of wind that turned the whole antenna installation into scrap metal. And at that point the contest began. That night a party-komsomol meeting of the team was held and a decision taken: Immediately start repairing the antennas so as to be able to start making contacts at dawn. The work took place by flashlight. The icy wind made skin literally stick to metal. At sunrise they began to repair the electrical lines. By 10.00 the basic antennas were restored and the electrical power turned back on. Without resting after the sleepless night, the team joined in the contest, which had been going on for seven hours. Using all their skill and willpower, the team conducted 5648 QSOs in the remaining 41 hours, received a multiplier of 548, and "earned" about 9 million points.

Building on the rich experience gained in these two contests, our sportsmen now want to try their hand in the multi-transmitter category.

A closing word: For unexplainable reasons, teams such as the above cannot earn the fully justified title of Master of Sport, International Class.

At the present time, an instruction has been worked out on the issuance of special call signs and radio expeditions. Those interested should consult the instruction in good time at the Radio Sport Federation of the USSR. Naturally, such a privilege is accorded only to the most worthy and promising sportsmen and teams, those having many years of successful experience on the air. ■

# Foxhunts at 1981 Melbourne Convention

Writer: Ian Bryce VK3BRY.  
Photos: Graeme Scott VK3ZJR.

The most competitive and active events at the convention were the Hidden Transmitter Hunts of various kinds. I suspect Ewen VK3BMV and myself Ian VK3BRY lost more friends than we gained though, in encouraging competitors to swim the Yarra, run four kilometres in 36 degree heat, drive over rough dusty roads in out-back Yarrambat, and fall into the Latrobe moat!

Two sessions of conventional direction-finding hunts were held, closely contested by four of the usual monthly foxhunt teams. Tracking down the fox proved fairly straightforward in the daylight, with only several minutes separating the hounds.

We first hid the fox in Banksia Park on the east bank of the Yarra (naturally the "far" bank). Three teams arrived on the west bank after a run through Warrigal Park, only to find to their anger that they were so near and yet so far. A "volunteer" from each team was forced at sniffer point to strip down to his jocks, fight through the blackberries, and swim across the Yarra.

The winner, Dick, of the VK3YJK team, was only a minute ahead of Peter from the VK3ATM team and Geoff VK3YRE. Four minutes later Paul V3YRS arrived on the correct side nice and dry.

Meanwhile the remainder of the VK3ATM team resumed the hunt by car, in case their swimmer was unsuccessful, or drowned. In the takeoff a door slammed on the antenna cable, and cut into it.

Now this would not normally be a serious thing. But Daryl's borrowed Austin 1800 generates positive earth, whilst their

two-metre converter requires negative earth. The converter case, co-ax and antenna had all been carefully insulated from the car's earth. And the converter naturally had a fuse only in its positive lead. Get the picture?

Smoke poured from the burning power lead. Daryl grabbed the sidecutters kept handy for such emergencies, and was able to remove the power.

Its power leads beyond repair, the converter had to be retired. A spare IC202 was brought into service, and the antenna cable was spliced.

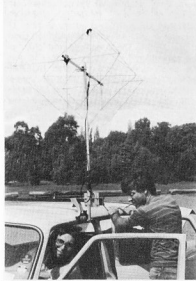
To let the hounds dry out, we next walked along an abandoned railway line in Macleod, and lowered the transmitter into a hole under a rusty sheet of iron. All teams arrived together and milled around in confusion until Daryl of the VK3ATM team peeped under the iron, then walked away before yelling the team's callsign. However, the others knew where he had been and the secret was out.

We held a "talk-in" foxhunt on the Saturday afternoon, a type we learned at the 1977 Convention in Canberra. Since only a transceiver on the 2m repeater is required, there were as many as 8 hounds, many of whom were not foxhunters. No direction-finding was allowed, only asking questions such as "Are you north of Grimshaw Street?" or "Can you see a cricket match?" to which we answered yes or no. Since we were evacuating 807's on an almost inaccessible easement, those working from a Melway were suitably confused. Geoff VK3YRE sprinted to victory with Peter of the VK3ATM team hot on his heels, then a 13 minute gap and a thrilling struggle for placings.

Sunday morning's conventional foxhunts caused unexpected visitations to a rocky knoll beside Whittlesea tip. VK3ATM won narrowly from VK3YRS. Geoff VK3YRE arrived exhausted on foot from Lalor. Since his team and car had still not arrived when the next hunt started, he hitched a ride with VK3ATM, who again won narrowly.

The afternoon's Pedestrian Foxhunts proved very popular, with many regular team members and a few newcomers. Honed to top performance by preceding hunts, the starts resembled 100 metre sprints. We had to resort to skulduggery at the finish to delay discovery until most had arrived.

We had planned to suspend our new miniature transmitter beneath the steel grill of an outlet of the moat, but alas, Ewen found the water had risen since our plans were laid. The pipe we had tippy-toed along was now submerged! We had to settle for a large plantation of tall reeds, which (as the hounds discovered unexpectedly) was growing in a metre of water, with a solid-looking tangle floating on top.

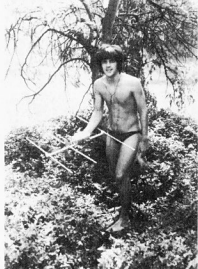


The cut antenna cable is repaired by Peter and Carlo. The quad antenna was later crunched into little pieces by a low branch.

For the second hunt, the eager hounds stampeded down the east and south sides of the moat. This caused much alarm among the artists of the Australian Sculpture Triennial, whose macabre creations littered the lawns and banks. After a tight-rope walk across a dam wall, the hounds who think in three dimensions realised the fox was on an elevated walkway above them. Daryl VK3YOU followed by Roger VK3YCL were first to find the way there.

For the third hunt, I found that the transmitter slipped neatly behind a layer of ivy clinging to a brick wall. To test the powers of suggestion, I awaited the hounds' arrival on an overlooking balcony. I was soon surrounded by panting hounds with whining sniffers running up and down the stairs! Roger VK3YCL followed by Peter VK3YVP (now VK3KAI) undertook a more methodical search and found it first.

The Direction-finding and Talk-in foxhunts were won overall by VK3ATM, followed equally by VK3YJK and VK3YRE. In the Pedestrian hunts VK3YCL excelled, with VK3YVP and VK3YOU coming equal second.



Dick of the VK3YJK team braved blackberries and the Yarra to get to the fox.

## QSP

### CLUB NET

The Redcliffe Radio Club Net will be held on 3.612 at 0930 GMT every Sunday. The first 30 minutes will be devoted to Club business and general discussion and afterwards the members will be available for contacts toward the Redcliffe City Award. An announcement will be made if Redcliffe Club members find it necessary to QSY to another frequency.

## AR SPECIAL

# A Report on the Activation of Burma Stations XZ5A, XZ9A

This report has been written from information supplied by Jin Fukuta JA8BMK, and was sent to Ken McLachlan VK3AH at his request.

Although a little disjointed in parts, the report was initially written in Japanese-style English, but we have retained this style partly to give the operator's point of view as he reports it.

It would appear that military supervision was evident at all times, and finally the "expedition" ended up with the military operators taking over.

In any event, the operation was factual, and as a result may help to introduce amateur radio activities to Burma after a long period of silence.

Our thanks to Ken VK3AH for passing on this information.

(VK3UV — Ed.)

"Burma" sounds so far away to me. Of course I know where it is on a map. In spite of its situation in the same Asia, it reminds me of a remote country.

I had realized the consequence of my expedition trying to break 16 years silence of radio activity. But little did I dream that my activity should come true until the very moment.

It was April 22nd when I left Asahikawa, where surrounded by mountains still covered with snow. Arriving Tokyo, I found the early summer had already come. Then a JAL jet plane at 1600 JST from Narita brought me to **KAW THOO LEI** (a state of Burma) in Burma after 36 hours. I arrived in a tiny town, which is situated 100 km from Moulmein, the second biggest city of Burma. It exists on so called "the visionary Asia Highway". There is no motor way at the moment, but only **Karen people** and Indian merchants travel this road taking three days and nights on foot to reach Moulmein. The border between **KAW THOO LEI** and Thailand is a small river one hundred metres wide. As it is in a dry season, there is little water, while in a rainy season the bridges are all carried away into the muddy river. I reached here with the help of Chinese and Indian merchants, the Thai and the Japanese who have remained in this area since the end of World War 2.

Even the correspondents of the army as well as the Karen living there had never come across the word "HAM". Under such circumstances it was a week later when we were able to get rid of their suspicion. Afterwards they become friendly and talked on modern electronics with each other. And at last they said, "While you stay here, we want to try the amateur radio activity".

In due course they brought some boxes like suitcases into the room. When I opened and looked at one of them I was shocked. What I saw in there was a Collins (US made) receiver, a Drake transmitter, a doublet antenna and even a microphone/key. I could not tell the model of Collins



Jin JA8BMK (with glasses) in readiness to commence operating XZ5A to bring Burma onto the amateur bands for the first time in 16 years. The watchful eye of the Burma military looks on.



Sanplo XZ5A's new and permanent operator.

because the label was off. As far as I saw, it is very similar to 75A4 receiver. The transmitter was obviously a T-4XB, which was a bit rusty. Setting up the antenna, I tried those two items. The receiver immediately began functioning and caught their military correspondence. But, unfortunately, the transmitter turned out to be impossible for practical use. There were no repair parts.

They were all operators of military correspondence. Some of them were good English speakers. I suppose that they mastered this language under the reign of English. They have a good command of radio engineering, too. The only thing they were lacking was the knowledge of how to do QSO. They had an ARRL Amateur Handbook, 1975 issue. It must have been the Bible for their knowledge of electronics seeing the cover was worn out completely. I wondered how often they consulted that scripture.

They learned a pattern of QSO and decided their call sign as XZ5A. The president and the minister of the country looked very enthusiastic. A Voice of KAW THOO LEI<sup>1</sup> (broadcasting on 7 MHz) got into trouble. It was a year since the station had been on air. This would be the first broadcasting after a long interval.

But I was totally at a loss because the transmitter was out of order. They said they would be able to find a new one within weeks. We doubted if it was really possible. There was a very strict check by the frontier police near the border. Even a transistor radio would be found by them. At any rate, we had to leave there till the chance would come as our visas were nearly over.

While we were waiting, we visited 8Q7 (Maldives Is.), 4S7 (Sri Lanka) and VU (India). We had a good opportunity to meet fantastic people. And really enjoyed the beautiful nature there. Above all, we cannot forget a row of houses and streets made of coral reef, and the deep blue of



The homebrew 3 element yagi being erected for XZ5A.

the sky and the beautiful sea coloured light blue. I am not exaggerating to say there was a Garden of Eden we human beings have forgotten. It is very attractive to all HAMS coming here from other countries in the world because as long as one has a licence copy of his country, one can obtain any call sign as one likes in half an hour. It took me only ten minutes to get the call sign 8Q7BM. There are over 2,000 islands, where there are nice resort hotels.

The dreamy surrounding made us forget time passing by. It was May 22nd when we came back to KAW THOO LEI. My face was bronzed by the strong sunlight. As soon as we came back and saw the Burmese, I was astonished to find amateur radio equipment. To our great surprise, it was a Kenwood TS-130S. "How on earth did they get it?" We could not believe our eyes. According to them, many Japanese

CB radios are brought into the black markets of Burma. However, they are all used for military use.

Before leaving Japan we had promised JA1BRK (one of the famous JA DXers) that we would be on air by the end of April at latest. But there was a long delay in the starting time to operate from Burma. After 12 hours since engaged time, everything was ready to go. At any rate, I turned on the transceiver with hesitation. It was almost twelve midnight on Friday. What came out immediately was a small pile-up of some JA stations calling a certain DX. In the meantime, I tried to call JA1BRK "TAC" at 21.270 MHz and succeeded in getting through. This QSO turned out a "first ever" from XZ5A. Then there was a great pile-up, I found it impossible to catch stations calling me. I made an announcement to them so as to distinguish each station easily in their spreading a few kiloHertz in the band, but most calls were focused on one frequency.

It was easier and faster to pick up some stations away from the net, though they were weak. I somehow managed approximately 250 stations within two and a half hours. The speed to work DX itself was much slower as compared with 9N1BMK DXpedition in 1979. Afterwards USA stations began to appear in the band and we then worked only them for a while. The signals were generally very weak. The maximum was 5 by 4, normally 3 by 4. Around daybreak, European stations came up. They were strong enough to copy. We went QRT at 2130 UTC on May 22nd on the first day.

During the first day, we were successful in having QSO with about 700 stations on SSB on 14/21 MHz. We were very tired from great excitement. We went to sleep until the noon of that day. No sooner than we got up, we remembered that we could work only 10 US east coast stations or so. So we decided to build up a full sized



Montage of Kawthoo Lei's President and well read ARRL Amateurs Hand Book.

3 element yagi on 14 MHz. It was a paralleled wooden boom with aluminium elements. Desperately necessary materials were obtained from the black market run by the Indians. From the evening with this antenna I tried to call USA at 14 MHz but in vain. It seemed there was no propagation at that time. On the third and fourth day, XZ operation's focus changed to Sanplo and Laydoh on the spot. They are both experts of CW. The light of barracks went out at 0900 Burma time every night. After that time a generator (Honda 500 watts) began to operate, but we were careful in stopping our operation by midnight, because we were afraid that the generator was making a terrible noise in the quiet forest and disturbing our neighbours. Also every day several QRTs were inevitable during the military communication hours.

That was how we had QSO with about 3,500 stations in total. You may well think the number was not so large. It is because our purpose was not to make DXpedition in Burma but we happened to get a chance to operate rigs when we went to KAW THOO LEI. Actually our operation time was from 7 to 8 hours a day and two-thirds of it was done by Karen operators. Now this station, VZ5A, has been registered as a club station, together with XZ9A. Those two stations have also been operating recently.

#### NOTE:

- 1 KAW THOO LEI . . . The name of Karen state in East Burma by pronouncing of Karen language.
- 2 Karen people . . . About 7 million population at present.
- 3 Voice of KAW THOO LEI . . . In 1980, for almost 1 year this broadcast could be heard on 7.15 MHz, running 10 kW output.

#### POSTSCRIPT

The following is an extract of a letter dated 12/7/81 from Jin JABBMK to Ken VK3AH which gives the current situation of Burma amateur radio operations.

"Sanplo (XZ5A) is 34 years old and Laydohmoo (XZ9A) is 37. Both are married with children, are well educated and speak good English.

"XZ5A is using a TS130S, VFO 230 with

CONFIRMING OUR QSO					
RADIO	DATE	UTC	RS(T)	FREQ MHz	2WAY
VK3AH	MAY 24	0429	5P	<input type="checkbox"/> 1.9 <input type="checkbox"/> 7 <input type="checkbox"/> 28 <input checked="" type="checkbox"/> XSSB	<input checked="" type="checkbox"/> CW
	DAY 24			<input type="checkbox"/> 3.5 <input type="checkbox"/> 14 <input type="checkbox"/> 50 <input type="checkbox"/> CW	<input type="checkbox"/>
	19 24			<input checked="" type="checkbox"/> 3.8 <input checked="" type="checkbox"/> 21 <input type="checkbox"/> 144 <input type="checkbox"/>	<input type="checkbox"/>

## XZ5A

#### EQUIPMENT:

KENWOOD TS-130S  
NAGARA TA-351  
DIPOLE

#### OPERATORS:

SANPLO (XZ5A)  
LAYDOHMOO (XZ9A)

QSL verified by:

XZ5A 73  
QSL MANAGER  
JIN JABBMK



XZ5A/XZ9A QSL cards.

14 and 21 MHz dipoles. Maybe the antenna will be changed to a 4 element tri-band (TA-351) and they will have a linear amplifier by July 20. QTH is about 100 km east of Moulmein, and XZ9A is 200 km north-east of Moulmein.

"XZ9A is also using a TS130S and will soon have a TA33JR tri-band antenna.

"Both stations are operating under the licence of the Kaw Thoo Lei Government (Karen State of Burma)."

## QSP

#### A SHIP IS A SHE

The word "ship" itself is from the Anglo-Saxon "scip" or Gothic "skip", both meaning boat. In the Royal Navy we draw a distinction between ship and boat, the latter being a smaller vessel usually without decks, which is carried aboard a ship. Certain exceptions exist: submarines, out of a sense of friendly rivalry, are often referred to as boats, and we refer to passenger ships as boats, though possibly not as a compliment. A ship is a she because: it is always feminine, hard to handle, needs men to run her, requires gliding and painting, comes into port and heads for the buoys, likes to show her topside and hide her bottom, is obstinate and perverse, is an object of affection, and whenever she sinks she takes a lot of good men down with her. —"RNARS Newsletter."

## QSP

#### REGION 1 BANDS PROPOSALS

At the IARU R1 Conference in Brighton at the end of April the gentleman's band plans for the new bands were considered and agreed as follows:—  
10 MHz — 10100-10140 kHz CW only, 10140-10150 CW and RTTY (SSB usable only in emergencies and as specified) — power not exceeding 250W mean output power — no contests — no credits for awards or diplomas. 18 MHz — 18068-18100 kHz CW only, 18100-18115 kHz CW and RTTY, 18115-18168 kHz CW and phone. 24 MHz — 24890-24920 kHz CW only, 24920-24930 kHz CW and RTTY, 24930-24990 kHz CW and phone. CW EME recommended frequencies were agreed as 144.000-144.015 MHz, 432.000-432.015 MHz and 1296.000-1296.015 MHz.—Rad. Comm., July 1981.

## 200 Metres and Down

A few copies of this book are still available from

MAGPUBS  
Box 150, Toorak, Vic. 3142

PRICE: \$4.50  
plus post on 300g

# Reciprocity of AR Licences

Do you anticipate a visit to an overseas country with some hope of operating from there?

Have you been asked by an overseas amateur coming to Australia if he can obtain a licence in Australia?

This is a complex subject but a selection of information from WIA sources may be found useful.

This article takes into account the provisions of formal reciprocal licensing agreements in addition to the ever widening trend towards "guest" licensing FOR VISITORS.

The former usually applies where a change of residence occurs and the latter applies as a separate concession only for bona fide visitors. Some countries apply both, whereas other countries will not issue any licence without there being a reciprocal licensing agreement in force between the licensing Administrations concerned. Australia operates both and has reciprocal licensing agreements with U.S.A., Canada, New Zealand, U.K., Switzerland, Malaysia, Singapore and India (nothing however for Novices except New Zealand). As a membership service, the WIA Executive Office, P.O. Box 150, Torrak, Vic., 3142, can often offer additional information on request.

## 1. General

All details given below assume the ownership and production of a valid and genuine amateur radio licence (or certified true copy in lieu) and evidence to prove identity and citizenship, visiting (or other) intentions and sometimes additional evidence, such as Morse speed proficiency and an address in the country for which a licence is required. In general terms, the grant of a licence would not confer a higher licence grade than you enjoy in your home country and there must be compliance with all the operating conditions for amateurs in the country concerned. There is a varying degree of delay country by country in obtaining a licence, if one is obtainable at all. Advance application and completion of appropriate application forms may be successful after a wait of up to 3 or even 6 months or more, depending on the country. In other countries a personal application on arrival will succeed even to the extent of over-the-counter service if your papers are in order. Licence fees vary from nothing in the USA to as much as \$20 or \$30 in other countries, even for a short term licence. Some countries may not recognise short-term licences issued in another country which is not of your citizenship. In many countries a licence expires in one year or when the home licence expires if earlier. Do not send the original of your licence through the ordinary mail (you require it at home anyway).

## 2. Australia

Personal application can be made at Department of Communications State Managers' offices (see DOC Directory for addresses). Applications in advance (3 months) should be sent to "Licensing Policy and Operations Branch, Department of Communications, GPO Box 5412CC, Melbourne, Victoria, 3001". Licences are granted to any overseas amateur on a bona fide visit to Australia not exceeding 12 months duration. For an overseas amateur coming to Australia permanently a licence is obtainable against a valid licence issued to a citizen of a country with which Australia has a reciprocal agreement; failing this, an Australian licence is only obtainable by passing the necessary Department of Communications amateur examinations in Australia. The licence fee is \$A17 (\$A14 for novice licences). Licence call signs are issued only in the normal VK series. Completion of secrecy declaration required. "Australia" includes Cocos and Keeling, Christmas, Willis, Norfolk Is., Melish Reef (etc.), and Australian Antarctica (Casey, Mawson, Heard and Macquarie Is.).

## 3. U.K. (and dependencies, Hong Kong, Gibraltar, etc.)

Apply at least 30 days in advance to — "Home Office (Radio Regulatory Department), Waterloo Bridge House, Waterloo Road, London, SE18UA, England" (or to appropriate Posts and Telecommunications Radio Licensing Branches in capital cities of dependencies). UK licences fee £8. Call signs in G5 plus 3 series or G8 plus 3 (VHF only). The UK has reciprocal agreements with over 25 countries. Full call Morse 12 w.p.m.

## 4. New Zealand

Personal application for over-the-counter licensing to NZ Post Office Engineering offices in Auckland, Christchurch, Dunedin and Wellington HQ (Wakefield Street). Applications in advance (2 weeks) to Wellington PO HQ. Call signs for Commonwealth visitors in ZL0 series. Full call Morse 12 w.p.m. New Zealand has reciprocal agreements with Australia, USA and France.

## 5. U.S.A. (and dependencies)

Fill in FCC Form 610A (obtain from FCC or ARRL) and mail, at least 60 days in advance, to "Federal Communications Commission, Box 1020, Gettysburg, PA 17325, USA" for a permit to operate. A permit for aliens is granted only to amateurs from countries with which the USA has reciprocal agreements (now over 50 countries). Call signs — your own home call/W1, W2, etc. Regular USA licences only obtainable by passing FCC exams. No licence fee. Applications by aliens to FCC field offices will still be routed to Gettysburg.

## 6. Canada

Apply in advance to "Director-General International Telecommunication Branch, Berger Building, 100 Metcalfe Street, Ottawa, K1S0V8, Canada". Canada has reciprocal agreements with nearly 40 countries and British Commonwealth countries. Special arrangements in force with USA for visiting amateurs.

## 7. Papua New Guinea

Apply in advance or in person to "Manager, Radio Branch, Department of Public Utilities, Postal and Telecommunications Services, GPO Port Moresby, PNG". Similar examinations, grades, operating conditions, etc., as in Australia.

## 8. Singapore and Malaysia

Many months delays after arrival Visitors' licences not known to have been issued.

## 9. Others

(a) Amateur radio is banned or allegedly inoperative in Afghanistan, Bangladesh, Burma, Khmer Rep., N. Korea, Malawi and Vietnam.

(b) No visitors' licences are known to be obtainable by Australians in Greece, Italy and Japan — also, probably, Indonesia and the Philippines.

(c) In India it is understood no licence is obtainable until after one year's residence.

(d) Short-term visitors equivalent licences in W. Germany (for 3 months — apply 6 weeks in advance) are obtainable — write to "DARC International Affairs, Postfach 1155, D-3507 Baunatal 1, Fed. Rep. of Germany". Fee and costs DM 15. Different procedure for intending residents.

(e) Short-term visitors' licences are understood to be obtainable in Belgium, Botswana, Brazil, Fiji (France?), Rep. of Guinea, Israel, Kiribati, Luxembourg, Morocco, Nigeria, Portugal (30 days max.), Swaziland, Rep. of South Africa, Sweden, Tonga (Vanuatu?), Zimbabwe.

(f) Negotiations are currently being conducted towards reciprocal licensing agreements with Costa Rica, Denmark, France (includes New Caledonia), Greece, Japan and W. Germany.

(g) Third party agreements exist between Australia and Canada (USA applied for but not yet finalised), between Canada and some 20 countries and between USA and some 30 countries. Phone Patch traffic in Australia has been applied for but was not granted at time of going to press.

(h) Licences for Maritime Mobile operations can only be used in home waters or on the high seas.

All information given is the best available at the time of going to press, and has been condensed due to print space. ■



# Andrews Communications Systems

## HAVE WE GOT A DEAL FOR YOU!

### KENWOOD TS-530S



- 160-10m inc W.A.R.C., SSB/CW modes.
- I.F. shift, VOX, N.B., RIT, XIT, mic gain

### BONUS OFFER!

THE PRICE

**\$779**

inc MC-10 &  
FREE TVI  
FILTER

### MORE CHEAP KENWOOD ...

- ★ TS-830M HF SSB Transceiver **\$999** (TS.830S **\$930**)
- ★ TS-130S SSB HF mobile. Now only **\$650** to clear.
- ★ R-1000 Receiver (no FM or optional memory) **\$429.**
- ★ TR-7850 40 W min. FM 2m Transceiver **\$420**
- ★ TR-7730 new 2m FM 25w Transceiver available at **\$329**
- ★ TR-9500 new UHF all-mode Mobile available at **\$595**

WE WILL NOT BE UNDERSOLD ON KENWOOD

### YAESU FT-290R

All-mode 2m portable

**\$349**



PLL with LCD display and  
10 mem. channels.  
SSB/FM/CW 2.5 w. Sup-  
plied with scanning mic.  
(FT-690 R 6m version  
avail. **\$339.**)

### SUPERB YAESU HF-VHF-UHF EQUIPMENT

- ★ FT-707 Best selling HF SSB transceiver **\$685** cash.
- ★ FP-707 power supply \$160, FC-707 tuner **\$130**
- ★ FTV-707 R transverter, opt. 6m or 2m or 70 cm **\$145**
- ★ FT-1012D HF SSB T'cvt, new model, rejection, **\$800**
- ★ FT-107M /DMS inc AC, due in soon at only **\$1150**
- ★ FT-208 R New LCD 2m FM hand-held due in at **\$345**
- ★ FT-708 R UHF LCD FM hand-held, available at **\$355**

All-mode FT-680R 6m, FT-480R 2m, FT-780 R 70 cm.  
Transceivers available on order at low prices.

### Bearcat 220 FB

20 ch. Scanning Receiver  
Compare to SX-200

**\$475**



- AM/FM, AC/DC
- 66-88 MHz
- 118-136 MHz
- 144-174 MHz
- 420-512 MHz

- Lockout/Priority/Delay

- Preprogrammed Marine & Aircraft bands



### REGENCY "TOUCH" M400E

DIRECT IMPORTER  
**\$419** FREE  
P&P

- ★ 30 Ch VHF/UHF scanning receiver!

- ★ EXCLUSIVE 5 kHz Chan-  
nelling on VHF Bands!  
(M100E \$365)

\* Variable search steps!

- ★ Covers 66-90MHz, 144-174MHz & 440-512MHz
- ★ Touch tone programming, AC/DC. Digital clock, etc

### NEW CE-35LX TRIBANDER!



Full size  
10 m reflector

**\$319**

Effectively  
4 el on 10m  
4 el on 15m and  
3 el on 20m

Maximum gain on 22' 6" boom

### CHIRNSIDE BEAMS

- New CE-35DX 5 element tri-  
bander, 19' boom. Effectively  
4 el on 10 m, 3 el on 15 m, 3  
el on 20 m, only **\$299**
- CE-42, CE-33, CE-36 beams  
and CE-5B vertical in stock.
- CE mobile helicals available.

### SOLID-STATE HF LINEAR AMPLIFIERS

- TP-500, 500w pep o/p, rx. pre-amp,  
only 10-20 w/drive needed 3 levels,  
**\$450**
- TP-350, 350 w pep o/p, rec pre-amp,  
required 10-30 w drive, 3 pwr. levels,  
**\$325**
- TP-200, 200 w pep o/p, rec. pre-amp,  
compare to HF3-100L2, only **\$185**
- Palomar TX-200, 4 levels, pre-amp,  
**\$219**

**CALL (02) 349 5792 or 344 7880 NOW!**

**SHOP 7, GARDEN ST, MAROUBRA JUNCTION, SYDNEY N.S.W.**

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**THE MAIL ORDER SPECIALISTS Write to: P.O. BOX 33, KENSINGTON N.S.W. 2033**

# FORWARD BIAS

## THE VK1 COMMITTEE

It is now just over six months since you, the members of the VK1 Division, elected the present Committee. Do you remember who they are, and the various tasks they perform on your behalf?

In case you have forgotten, and to inform our many new members, the complete list is published below.

President:	
BILL MAXWELL	VK1MX
Vice-President, also Broadcast Manager, Repeater Group Contact:	
ANDREW DAVIS	VK1DA
Vice-President, also Alternate Federal Councillor, Intruder Watch Co-ordinator, VK1 Awards Manager:	
FRED ROBERTSON-MUDIE	VK1MM
Secretary and Publicity Officer:	
THEO VIDLER	VK1KV
Treasurer:	
KEVIN OLDS	VK1OK
Education Co-ordinator:	
IAN COLEMAN	VK1NDI
Book Sales:	
KEN PYETT	VK1NDK
Meeting Activities Co-ordinator:	
CEC MALONEY	VK1NCX
Federal Councillor and Federal WIGEN Co-ordinator:	
RON HENDERSON	VK1RH
Apart from the above list of elected officers there are a number of other tasks carried out by non-elected members:—	
Property Officer:	
GAVIN BERGER	VK1NEB
Federal Contest Manager:	
REG DWYER	VK1BR
VHF Repeater Manager:	
PETER SMITH	VK1DS
UHF Repeater Manager:	
EDDIE PENKIS	VK1VP
Class Instructors:	
DAVID BOEHM	VK1UD
OWEN COOK	VK1CC
WIGEN Co-ordinators:	
ROB APATHY	VK1ZAI
IAN DALWOOD	VK1ZAG
DICK ELLIOTT	VK1ZAH
QSL Manager (Inward):	
MORI FOSTER	VK1MF
QSL Manager (Outward):	
TED PEARCE	VK1AOP
Public Officer:	
REX ROSEBLADE	VK1QJ

Ours is by far the smallest Division, having only about 170 members out of a total of 308 licensees in the Territory. And yet from these 170 members we elect or appoint 21 members to carry out the administrative functions of the Division. Perhaps it would be easier for all if we could recruit those other 138 non-members to the Institute.

## THE VK1 UHF REPEATER

Eddie VK1VP has advised that the new UHF repeater VK1RUC will be placed on test in Canberra in the near future. The input frequency will be 433.52 MHz and output frequency 438.525 MHz, this being the prime UHF FM repeater channel as is used in Sydney, Melbourne and other capital cities.

Following the test period and with the return of a negotiable road in the spring the new repeater will be co-located with our VHF repeater VK1RGI on Mount Ginini, where it will feed into a coaxial colinear antenna having a gain of 5-6 dB. Power into the antenna will be 5 watts. With an expected radiated power of approximately 20 watts from its location on Mount Ginini, about 5800 feet above sea level, it is expected that VK1RUC will provide UHF communication over a considerable area of southern NSW and hopefully beyond.

## REMEMBRANCE DAY CONTEST 1981

By the time you read this column the RD Contest will have taken place. For full details see your July copy of AR, page 53.

Competitors should note that the scoring system has been changed this year to the extent that each contact scores 1 point only on AM, FM and SSB, and 2 points only on CW/CW, SSTV/SSTV and RTTY/RTTY, with no special allowances for contacts with distant States, ZL or P29, as was the case in past years.

A limited supply of copies of the recommended log sheets is available to VK1 members from Theo VK1KV, phone Canberra 88 1767 (AH) or 45 3254 (BH). Alternatively, you should ensure that your log sheets and the cover sheet are in accordance with the examples shown in the July AR.

President Bill has intimated that the RD trophy would make a very nice addition to his trophy case for the next 12 months (at least).

73. VK1KV. ■

# VK2 MINIBULLETIN

## COUNCIL REPORT

Two new positions were created within the Division at the July meeting of Divisional Council. Jim Saunders VK2BNY was appointed VK2 WIA Co-ordinator of the Disabled and Wally Watkins VK2DEW (Alternate Federal Councillor for NSW) was appointed VK2 Contest Publicity Officer. Jim's position will entail co-ordination of information and advice on aspects of disabled persons' involvement in amateur radio, citizens band radio and shortwave listening. Interested persons can write to Jim at his call book address with information or requests. Wally is well known in contest circles as the immediate past Federal Contest Manager and can also be contacted at his call book address.

To encourage NSW participation in the Remembrance Day Contest, the NSW Divi-

sional Council will award Merit Certificates to those stations operating in NSW who gain a first, second or third place in all sections of the contest each year. The certificates have been designed by Divisional Councillor Steve Pail VK2VPH.

At the July meeting the recommendations of the Fourth Conference of Clubs were discussed by Council. Many of the recommendations were adopted, including the one recommending investigation of the sale of Atchison Street and replacement with a property in the Parramatta area. The suggested fox hunt frequencies of 144.3, 146.55, 28.47, 7.04 (rather than 7.05 144.3, 146.55, 28.47, 7.04 (rather than 7.05 which is a primary WIGEN frequency) and 439 MHz were adopted. The motion that K calls be allowed to use CW on 6m and up will be presented as a VK2 motion at the next Federal Convention. Henry Lundell VK2ZHE will organise the details for a VK2 Home-brew Contest. The concept of affiliated clubs who relay Divisional broadcasts conducting 5 minutes of local news at the conclusion of each broadcast was adopted and permission is now being sought from DOC. The motions requesting repeaters from 29.5 to 29.7 MHz and increased deviation on 10m have been referred to FETAC for investigation of feasibility and desirability. Several contest matters are either being referred back to clubs for more specific details or passed on to the Federal Contest Managers.

Council received and discussed the DOC statistics for the February AOCOP and supplementary novice Morse exams. The strikingly low NEW results in all exams (except AOCOP theory) are being queried by our Federal Councillor Tim Mills VK2ZTM.

Perhaps some of you have noticed a difference in recent Divisional broadcasts. They are now all being conducted from Dural. The new facilities at Dural offer a number of advantages, including separate soundproof booths for announcer and engineer, automatic selection of broadcast transmitters, remote clarifier for SSB receivers, push button selection of audio source and a high quality tape deck. Each booth has its own console which may be operated independently allowing two sets of callbacks to be taken simultaneously or linked together for broadcasts so that only the engineer need worry about transmitter selection, audio levels, etc. Each console is fitted with a digital clock. Initially only the announcer's console is available for use, but the second console should be operating soon. If you would like to be included on the roster for broadcasts, even if only once or twice a year, please write to Divisional Office, Box 123, St. Leonards 2065, specifying whether you wish to be announcer or engineer on either the morning or evening broadcasts or both. A new crystal for the 2m beacon at Dural has been ordered and the beacon will soon be moving to 144.42 MHz in accordance with the beacon bandplan. Work on the 160m transmitter is slowly progressing,

# HF, UHF and VHF ANTENNAS BY ATN

			Price incl. balun
15/11/10 mx			\$36
ATN 20-30-1 rotary dipole			
10/11 mx model	Gain dbi	Boom	
ATN 28-30-3 or 27-29-3	9.7	3.5M	\$85
ATN 28-30-5 or 27-29-5	12.0	6.5M	\$145
ATN 28-30-6 or 27-29-6	13.2	8.3M	\$189
6 mx			
ATN 50-52-5	11.9	3.5M	\$90
ATN 50-53-8	14.2	5.5M	\$140
ATN 50-53-11	16.2	9.0M	\$175
2 mx			
ATN 144-148-8	12.7	2.2M	\$50
ATN 144-148-11	14.6	3.8M	\$60
ATN 144-148-16	17.0	6.3M	\$80
ATN 144-148-13WS	17.3	7.0M	\$80
70 cm Model (N Conns)			
ATN 420-470-6	10.2	0.6M	\$40
ATN 420-470-14	14.2	1.5M	\$55
ATN 420-440-11	15.7	1.85M	\$60
ATN 420-440-15	16.7	2.85M	\$70
ATN 432-16LB	17.2	3.7M	\$80
UHF CB (N Conns)			
ATN 47-5	9.2	0.65M	\$42
ATN 47-7	10.2	0.7M	\$45
ATN 47-11	17.0	1.7M	\$55
ATN 47-15	17.8	2.8M	\$65
Amateur TV Translator			
ATN 580-14 (N Conns)	17.5	2.0M	\$60

Also available power dividers/couplers, quarter wave sleeve baluns and matching harnesses for stacks of two or more arrays; also 1:1 and 1:4 baluns in 200W or 1 kW and insulators for homebrew.

## ALL LISTED HF ANTENNAS use top grade 6063-T83

seamless tapered and swaged tubing elements with non-brittle ABS tough weather resistant insulators. Booms are 2" OD (longer booms use guys supplied) and elements taper from 1/4" OD or 5/8" OD depending on length. Longer elements use positive rake on insulators to reduce unsightly sag. The best possible materials have been chosen to suit tough Australian weather conditions.

## TRAPLESS TRIBANDERS, 13-30 MHz, Continuous Coverage (Includes new WARC & CB) (LOG PERIODICS)

Model	Elements	Boom (metres)	Gain dbi	Price with Balun 200W	1 KW
13-30-6	6	6.0	7.5	\$259	\$279
13-30-8	8	8.5	9.0	\$389	\$409

## TRAPLESS DUOBANDERS, 20-30 MHz, Continuous (Includes new WARC & CB) (LOG PERIODICS)

20-30-6S	6	4	7.5	\$169	\$189
20-30-6L	6	6	8.5	\$199	\$219
20-30-8	8	8.5	10.2	\$279	\$299

## MONOBANDERS — For 14 and 21 MHz

14-14.4-4	4	7	10	\$239	\$259
21-21.5-4	4	6	9.9	\$179	\$199
21-21.5-5	5	8	11.2	\$269	\$289

# ATN ANTENNAS

ALSO AVAILABLE FROM: VIC. (03) 873 3939  
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56 CAMPBELL STREET, BIRCHIP, VIC., 3483  
PHONE (FACTORY) (054) 92 2224 (OFFICE) (054) 92 2264

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AS REVIEWED IN AR, MAY 1980

## FEATURES:

- Built-in Receive Preamp
- Adjustable delay for SSB
- Remote control operation with optional RS-1 Remote Head
- 1 to 2 Watts in — 15 to 30 Watts out — Excellent for HTs
- Automatic internal or external relay keying

## SPECIFICATIONS

Frequency Range	144 to 148 MHz
RF Power In	200 mw to 15 Watts
RF Power Out	80 Watts nom. (10 in - 80 out)
Modes	SSB, FM and CW
Receive Preamp	10 db gain min. 2.5 db $\pm$ .5 db noise figure
DC Power	13.6 VDC 10-12 Amps
Size Weight	5.375" x 3" x 8", 3 lbs.

WARRANTY ON ALL MIRAGE PRODUCTS 5 YEARS  
(1 year RF Power Trans.)

## B108 2 METER AMPLIFIER 10W IN — 80W OUT



Amateur Net **\$239**

DUAL PURPOSE — H.T.s or Transceivers

B 23	2 Metre Amplifier	2 W in, 30 W out	\$119
B 1016	2 Metre Amplifier	10 W in, 160 W out	\$359
B 3016	2 Metre Amplifier	30 W in, 160 W out	\$299

Average and Peak Reading Wattmeter/SWR		
Model MP1	HF	\$159
Model MP2	VHF	\$159

# ATN ANTENNAS

56 CAMPBELL STREET, BIRCHIP, VIC., 3483  
PHONE (FACTORY) (054) 92 2224 (OFFICE) (054) 92 2264

although there are still problems with the HT interlocks. Transmitters used at present for broadcasts and callbacks include 80m AM, 40m AM, 40m SSB, 10m SSB, 6m SSB, 6m FM, 2m SSB, 2 x 2m FM and 70 cm FM. Broadcast frequencies and times are published each alternate month in the WIA Directory in the front of AR.

#### TOWER APPEAL

The appeal (see past ARs for details) was heard on Tuesday, 21st July, in the Land and Environment Court in Sydney. Three Divisional Councillors attended the court. A total of six witnesses gave evidence; the Campbelltown City Council Town Planner and two neighbours of Mal Martyn VK2VWG gave evidence in opposition to the tower application, while Mr. Martyn, a Town Planning Consultant and a Broadcasting Engineer gave evidence in support of the application. Much evidence in the form of statements, maps and photographs was tendered. Having heard submissions for a full day, the court deferred judgement until after the assessor had seen the proposed tower site and other towers of similar construction as proposed by Mr. Martyn. To date (31/7/81) no decision has been handed down.

Many thanks to those who have written to Divisional Council supporting this case. Recent donations are gratefully acknowledged from: B. McNeil \$5, G. Myers (wife of late VK2VN) \$10, R. Gandevia \$10, F. Tam \$20, R. Dolphin \$3, M. Black \$50, I. Chappel \$2, P. Jeremy \$10, E. Breen \$10, S. Cooper \$5, B. Grainger \$5, J. Swan \$10, W. Watkins \$25, G. O'Brien \$20, A. Bauer \$5, B. Watt \$25, H. Hart \$50, J. Saunders \$20, L. Greenwell \$10, Margaret \$5, J. Gaynor \$10, W. Moore \$10, H. Freeman \$10, I. Baker \$20, Orange ARC \$100, R. Alford \$20, K. Claffer \$20, A. Efimov \$10, A. Topp \$5, G. Camp \$10, Taree ARC \$43, K. Kimberley \$10, A. Sullivan \$5, A. Lundy \$10, Central Coast ARC \$50, J. Faulkner \$10, B. Turnbull \$10, L. Connolly \$5, B. Connolly \$5, M. Connolly \$5 and Mid-South Coast ARC \$25. To date (31/7/81) \$2,171 has been donated to the appeal. If you would like to donate to this appeal, please send cheques made out to WIA Tower Fund to Box 123, St. Leonards 2065.

#### SOUTH WEST AMATEUR RADIO SOCIETY 29th ANNUAL CONVENTION

The 29th Convention of SWARS is to be held at Tumut on the long weekend, 3rd and 4th October.

The venue for the Convention is the Tumut Racecourse, which is a very good location for a Convention of this type, as the grounds are safe for children and have plenty of shade and shelter.

A programme of field events has been arranged and also bus and car trips to the many scenic areas in the Tumut district.

On the Saturday a conducted trip to the Buccleuch State Forest is planned to see the many facets of the timber industry in the area with some of the biggest timber harvesting operations in Australia.

The trip will also go to the 4000 feet Mt. Tumorrara, to the east of Tumut, to see the best view in the south and work the VHF DX.

On the Sunday a bus trip has also been arranged to take visitors to Batlow, to Blowering Dam and the Blowering Forest parks, then to Talbingo power station and back to Tumut via the eastern shores of Blowering Dam.

The Blowering parks are now famous for their many animals and birds, and for recreation.

For a programme and accommodation bookings contact:—

The Secretary Tumut Amateur Radio Club, Ted Dean, 93 Lockhart Street, Adelaide, NSW 2629.

Please note that accommodation bookings must be made by the forwarding of \$20 per room before the 19th September, as accommodation in Tumut is at all times at a premium over any holiday weekend. VK2DLZ Tumut.

The VK2 QSL Bureau, now housed at Westlakes Amateur Radio Club, York Street, Teralba, is open each week on Wednesdays from 9 a.m. to 5 p.m. and Saturdays from 1 to 6 p.m. The Bureau is also open at other times during the week and the Club can be contacted at any time on (049) 58 1588. QSL information is now stored on a computer programme designed by one of the regular sorters, Milton VK2DCW.

#### COMING EVENTS

12-13th September: Noel Taylor Memorial Field Day, Tamworth.

15th September: Closing of agenda for 5th Conference of Clubs.

19-20th September: Amateur radio display at Orange Blossom Festival, Castle Hill.



A view of the shelves containing sorted cards (at rear). L. to R. Keith VK2AKX, Eric VK2KEB (both standing), Milton VK2DCW and Trevor VK2KAQ.

Crestwood ARC. Contact: David VK2KDS on (02) 624 2636.

3-4th October: SWARS Field Day at Tumut.

1st November: 5th Conference of Clubs hosted by Illawarra ARS.

NSW clubs and members are invited to submit news for inclusion in this column to Box 123, St. Leonards 2065, by 28th September for November AR.

Susan Brown VK2BSB.



Some of the regular Saturday sorters at the Bureau: L. to R. Eric VK2KEB, Milton VK2DCW (seated in front of his computer), Ern VK2BYY, Trevor VK2KAQ, Keith VK2AKX and Wal VK2BZK (in front).

# VK4 WIA NOTES

# QRM

## QSL CARDS

Your Divisional Council has again been able to negotiate with the Queensland Tourist and Travel Corporation for the supply of an additional issue of QSL cards. A limited number is available to members for the price of postage and arrangements have been made public over the weekly News and Information Service. The cards feature the logo of the 1982 Commonwealth Games Foundation and will prove ideal for over-printing with the AX prefix during September 1982.

## SUNSHINE STATE CONTEST

The results of the 1981 Contest should be available next month. Over 25 shires and about ten cities and towns were activated during the contest, including some relatively rare ones. Thanks to Bill VK4XZ for a well run contest.

## WORKED ALL QUEENSLAND AWARD

Council has approved some updates to the rules for this popular award. Thursday Island has been deleted from the "Cities and Towns" list, whilst Logan City has been added. Logan and Burrum Shires have been deleted from the "Shires" list, whilst Arakune, Mornington and Torres Shires have been added. Amended rules are available on request from the Secretary. Listen for rare shires each week on the Queensland Net (Thursdays 1930K on 3605 kHz).

## SLOW MORSE BROADCASTS

The Division sponsors the running of slow Morse training broadcasts for the benefit of listeners in Northern Australia. The sessions are held every Monday to Friday at 1930K on 3580 kHz. All amateurs are requested to try to keep this frequency as clear as possible—remember your own learning difficulties.

## JOTA

Have you been in contact with your local Scout or Guide group yet? JOTA always seems to go better if you can visit the group prior to the weekend and give them a little training in what to say and how to say it. This is one of the few opportunities we have to present our hobby to the general public—make the most of it.

## CLUB LIAISON

Planning has commenced for the 1982 Radio Club Workshop and clubs will have received the first requests for input. This is your opportunity to partake directly in policy decisions, so don't let it pass. Be involved at your Club meetings. If you live away from club areas, send your thoughts to Council direct. The Club Liaison Net is held each Tuesday at 1930K on 3605 kHz.

## GENERAL MEETING

General meetings are held in the Playground and Recreation Centre, corner of Love and Water Streets, Fortitude Valley, Brisbane, on the third Friday of the month. Visitors are most welcome and doors open about 1930K. ■

## NORTH-WEST NOTES

Again another well attended meeting. Special guest for the evening was the member of State Parliament, Mr. Roger Groom, M.L.A. Mr. Groom spoke briefly on draft frequency allocations. Members were asked to forward submissions to him and these would be conveyed to Mr. Sinclair, Minister for Communications.

A lengthy discussion took place on the re-allocation of TV channels 5A and 0. Further discussion during the evening relating to CB and repeaters culminated an excellent format. Thanks for the notes, Jim.

## NORTHERN NOTES

During the evening a motion was moved by Northern Branch members that we purchase a portable generator for Northern Branch members envisaged usage in VK7 and islands, for DXpeditions, both VHF and HF. The motion was carried unanimously in favour. The meeting was well attended, with Frank VK7BC, well known DXer, announcing that an educational evening had been arranged in the form of a visit to the recently completed Aust. Maritime College. Approximately 60 attended, leaving many a member chatting with envy at the equipment available for students during their period of training.

## SOUTHERN NOTES

Further notes supplied by Bill Tanner VK7TE regarding the famous Sewing Circle Net 3590 kcs. 0700Z, Monday to Sunday.

The above net originated many years ago (date unknown) when a batch of crystals were purchased, frequency 3590. Some early participants were Jack Batchler VK7JB, Bob O'May VK7OM, Ray Conrads VK7TR, Crosby Wadch, John Milne VK7AG, Lloyd Chapel VK7LC, Poly Clark VK7CK, Merv Conway VK7CL, Pat Geeves VK7GV, Bill Tanner VK7TE, Bill Carter VK7AK, Joe Brown VK7BJ, Maurice Glover VK7MG, Alan McKercher VK7AT, Alan McKeown VK7YZ and also VK3AJA. Jack McKercher VK7NUK, a member unknown to many amateurs, first licensed 1978 and now a silent key. Mr. Jack McKercher VK7NUK was a very active amateur for a short period. After many years of studying with a permanent disability (arthritis) and understanding tutors, persevered with success, enabling VK7NUK to be communicating with other amateurs world-wide. After only 6 months on the bands Jack VK7NUK passed away in 1979, leaving his son Alan VK7AT. Incidentally, Alan VK7AT is still residing at Stiegitzly via St. Helens and his warm hand of friendship is extended to all visiting amateurs. Jack's experience in radio goes back to the 1920s, at which time he manufactured one of the first AC radios.

## DX-PEDITION TO NEW ZEALAND

Remember Jim's VK7KOW (ex VK7NOW) recent DXpedition to New Zealand? Well—

I had hoped to bring back news how ZL of the 1906 Marconi Spark Station which was used in 1906 at East Devonport, Tasmania, together with a sister station at Queenscliff in VK3, to demonstrate to the then Australian Government that this new thing "Wireless" would work. The demonstration, the first in Australia, was most successful.

The Tasmanian station later went to Christchurch for display at the big exhibition in 1907. Since then all trace of it has been lost.

I visited MOTAT in Auckland (Museum of Transport and Technology) and was shown all the communication gear by the Assistant Director, who referred me to some people in Wellington. I spoke with the Chief Engineer of the NZ Broadcasting Service, who kindly gave me some important photocopies of pictures and reports of the early radio transmissions in ZL.

He then referred me to Tom Clarkson ZL2AZ, the NZ Post Office's First Engineer. Tom told me that he knew of the old Marconi station, but thinks that it may have been "dumped". He also talked to me about the first half kilowatt spark station that he installed for the post office.

If readers would like to see actual photos of this very first station, I have three excellent photos showing the antenna, transmitter building and the transmitter and receiver, plus associated gear.

73. VK7AN/NAB. ■

## QSP

### ANTI-JAMMING MILITARY RADIO

The first military radio with anti-jamming capability to go into production will enter service in Europe with NATO forces in the next three months.

Called the Jaguar-V (standing for Jamming Guarded Radio—Very high frequency), the equipment has been developed by Racal, which forecasts that it will bring orders worth hundreds of millions of pounds sterling in the 1980s, the majority from overseas defence forces which see a threat to their military communications.

The advantages of Jaguar-V lies in its frequency hopping— that is, changing its transmitting frequency through the complete range many times a second, thereby depriving an enemy of the opportunity of jamming available with equipment that stays on a single identifiable frequency.

Racal says that Jaguar-V is urgently needed because of recent improvements in jamming techniques. The British Army has ordered the equipment for extensive trials.

Radio communications, for both military and civil markets, are one of Racal's two main areas of activity. The other is data communications. The group, with headquarters at Bracknell, west of London, has sold to more than 150 countries and in 1979 its exports were worth nearly \$190 million. In April it won the British electronics industry's Tobie Award as "Exporter of the Year". (News Release, British Consulate-General, Sydney, 3/6/81.) ■

### CALL SIGN CAUTION

It has been noted from time to time that there is a tendency to use partial call signs, especially on VHF, such as "XYZ" instead of "VK2XYZ". Sections 6.34 to 6.44 of the regulations apply to call signs, and the information therein should be noted and adhered to.—From VK2TTY broadcast, 3rd May, 1981. (Propagator, June 1981.) ■

# Explanatory Information on the New Method for Designating Emissions

(This information was released to the WIA by the Department of Communications)

## INTRODUCTION

The designation of emissions is one of the fundamental tools of radio frequency spectrum management, providing essential information to the spectrum manager. The objective is to record accurately and concisely the significant characteristics of emissions.

The ready availability of this information assists the radio spectrum manager in planning the protection of services from mutual interference; the availability of a concise system facilitates the exchange of accurate information in both the national and international environment.

The new method of designating emissions is the result of about 20 years of effort on the part of the International Radio Consultative Committee (CCIR) in collaboration with the International Frequency Registration Board to improve the present method, which was developed many years ago and was becoming increasingly inadequate to cater for new and more complex emissions.

Australia, as a member country of the International Telecommunication Union, is obliged to adopt the new method in its international dealings and as a consequence intends to implement the new method for national use.

The following information will serve to explain to interested persons the method to be adopted.

The new method will come into use on a world-wide basis on 1 January 1982, but Australian licensees are requested to commence using it as soon as possible.

## SALIENT FEATURES OF THE NEW METHOD

Full designation of emissions will comprise a total of nine alphanumeric symbols, the first seven being mandatory. These nine symbols are divided in the ratio 4:3:2.

The first four symbols provide details of the necessary bandwidth which can range from 0.001 Hz to 999 GHz.

The next three symbols provide details of the basic characteristics of the emission.

The last two symbols, which are optional, describe any additional characteristics which may be useful in providing a more complete description of the emission.

## THE NEW METHOD

### The first four symbols:

The first four symbols provide details of the necessary bandwidth which is defined as:—

"For a given class of emission, the width of the frequency band which is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions."

The necessary bandwidth shall be expressed by three numerals and one letter. The letter occupies the position of the decimal point; it represents the Unit of bandwidth and may be H for Hertz, K for KiloHertz, M for Megahertz or G for Gigahertz. In order to avoid a given bandwidth being expressed in more than one way depending upon the choice of the unit, it is specified that the further character shall be neither zero nor K, M or G. It is further specified that the necessary bandwidth.

- between 0.001 and 999 Hz shall be expressed in Hz (letter H);
- between 1.00 and 999 kHz shall be expressed in kHz (letter K);
- between 1.00 and 999 MHz shall be expressed in MHz (letter M);
- between 1.00 and 999 GHz shall be expressed in GHz (letter G).

### The next three symbols:

These symbols describe the basic characteristics of the radio emission.

The first symbol defines type of modulation of the main carrier;

The second symbol defines nature of signal(s) modulating the main carrier;

The third symbol defines type of information to be transmitted.

It is not possible to give the minimum required information on the emission without the use of all the three symbols.

1 First symbol — type of modulation of the main carrier.

1.1 Emission of an unmodulated carrier N

1.2 Emission in which the main carrier is amplitude-modulated (including cases where sub-carriers are angle-modulated)

- 1.2.1 Double-sideband A
- 1.2.2 Single-sideband, full carrier H
- 1.2.3 Single-sideband, reduced or variable level R
- 1.2.4 Single-sideband, suppressed carrier J
- 1.2.5 Independent sideband B
- 1.2.6 Vestigial sideband C
- 1.3 Emission in which the main carrier is angle-modulated F
- 1.3.1 Frequency modulation G
- 1.3.2 Phase modulation
- 1.4 Emission in which the main carrier is amplitude- and angle-modulated either simultaneously or in a pre-established sequence D
- 1.5 Emission of pulses! P
- 1.5.1 Unmodulated sequence of pulses
- 1.5.2 A sequence of pulses —
  - 1.5.2.1 modulated in amplitude K
  - 1.5.2.2 modulated in width/duration L
  - 1.5.2.3 modulated in position/phase M
  - 1.5.2.4 in which the carrier angle-modulated

TABLE 2

Necessary bandwidth	Present method of designation	New method of designation
100 Hz	0.1	100H
850 Hz	0.85	850H
5,450 Hz	5.45	5K45
25,450 Hz	25.5	25K5
16,000 Hz	16.0	16KO

during the period of the pulse

1.5.2.5 which is a combination of the foregoing or is produced by other means

1.6 Cases not covered above, in which an emission consists of the main carrier modulated, either simultaneously or in a pre-established sequence, in a combination of two or more of the following modes: amplitude, angle, pulse

1.7 Cases not otherwise covered

2 Second symbol — nature of signal(s) modulating the main carrier

2.1 No modulating signal

2.2 A single channel containing quantized or digital information without the use of a modulating sub-carrier?

2.3 A single channel containing quantized or digital information with the use of a modulating sub-carrier

2.4 A single channel containing analogue information

2.5 Two or more channels containing quantized or digital information

2.6 Two or more channels containing analogue information

2.7 Composite system with one or more channels containing quantized or digital information, together with one or more channels containing analogue information

2.8 Cases not otherwise covered

3 Third symbol — Type of information to be transmitted?

3.1 No information transmitted

3.2 Telegraphy — for aural reception

3.3 Telegraphy — for automatic reception

3.4 Facsimile

3.5 Data transmission, telemetry, telecommand

3.6 Telephony (including sound broadcasting)

3.7 Television (video)

3.8 Combination of the above

3.9 Cases not otherwise covered

#### The last two symbols:

These symbols describe any additional characteristics useful in providing a more complete description of the emission. The use of these symbols is optional; however, it is recommended these be employed when known.

The first symbol defines details of signals;

The second symbol defines nature of multiplexing.

Where these symbols are not used this should be indicated by a dash where each symbol would otherwise appear.

4 First symbol — Details of signal(s)

### COMPARISON OF DESIGNATIONS OF TYPICAL EMISSIONS

Type of Modulation of Main Carrier	Type of Transmission	Supplementary Characteristics	Current Symbol	New Symbol
Amplitude Modulation	With no modulation	—	A0	NON
	Telegraphy without the use of modulating audio frequency (by on-off keying)	—	A1	A1A (for aural reception)
	Telegraphy by the on-off keying of an amplitude modulating audio frequency or audio frequencies, or by the on-off keying of the modulated emission (special case: an unkeyed emission amplitude modulated)	—	A2	A2A (for aural reception)
	Telephony	Double sideband	A3	A3E
		Single sideband full carrier	A3H	H3E
		Single sideband reduced carrier	A3A	R3E
		Single sideband suppressed carrier	A3J	J3E
		Two independent sidebands	A3B	B8E
	Facsimile (with modulation of main carrier either directly or by a frequency modulated sub-carrier)	—	A4	A3C
		Single sideband reduced carrier	A4A	R3C
	Television	Vestigial sideband	A5C	C3F
	Multichannel voice-frequency telegraphy	Single sideband reduced carrier	A7A	R7B
	Cases not covered by the above, e.g. a combination of telephony and telegraphy	Two independent sidebands	A9B*	B9W
Frequency (or Phase) Modulation	Telegraphy by frequency shift keying without the use of a modulating audio frequency: one of two frequencies being emitted at any instant	—	F1	1st Symbol F = Frequency modulation G = Phase F1A (for aural reception) G1A
	Telegraphy by the on-off keying of a frequency modulating audio frequency or by the on-off keying of a frequency modulated emission (special case: an unkeyed emission, frequency modulated)	—	F2	F2A (for aural reception) G2A
	Telephony	—	F3	F3E G3E

Type of Modulation of Main Carrier	Type of Transmission	Supplementary Characteristics	Current Symbol	New Symbol	
Frequency (or Phase) Modulation (continued)	Facsimile by direct frequency modulation of the carrier	—	F4	F3C G3C	4.1 Two-condition code with elements of differing numbers and/or durations A
	Television	—	F5	F3F G3F	4.2 Two-condition code with elements of the same number and duration without error-correction B
	Four frequency duplex telegraphy	—	F6	F7B G7B	4.3 Two-condition code with elements of the same number and duration with error-correction C
	Cases not covered by the above, in which the main carrier is frequency modulated	—	F9*	FXX†	4.4 Four-conditioned code in which each condition represents a signal element (of one or more bits) D
Pulse Modulation	A pulsed carrier without any modulation intended to carry information (e.g. radar)	—	P0	P0N	4.5 Multi-condition code in which each condition represents a signal element (of one or more bits) E
	Telegraphy by the on-off keying of a pulsed carrier without the use of a modulating audio frequency	—	P1D	K1A (for aural reception)	4.6 Multi-condition code in which each condition or combination of conditions represents a character F
	Telegraphy by the on-off keying of a modulating audio frequency or audio frequencies, or by the on-off keying of a modulated pulsed carrier (special case: an unkeyed modulated pulsed carrier)	Audio frequency or audio frequencies modulating the amplitude of the pulses	P2D	K2A (for aural reception)	4.7 Sound of broadcasting quality (monophonic) G
		Audio frequency or audio frequencies modulating the width (or duration) of the pulses	P2E	L2A (for aural reception)	4.8 Sound of broadcasting quality (stereophonic or quadrasonic) H
		Audio frequency or audio frequencies modulating the phase (or position) of the pulses	P2F	M2A (for aural reception)	4.9 Sound of commercial quality (excluding categories given in sub-paragraphs 4.10 and 4.11) J
	Telephony	Amplitude modulated pulses	P3D	K3E	4.10 Sound of commercial quality with the use of frequency inversion or band-splitting K
		Width (or duration) modulated pulses	P3E	L3E	4.11 Sound of commercial quality with separate frequency-modulated signals to control the level of demodulated signal L
		Phase or duration modulated pulses	P3F	M3E	4.12 Monochrome M
		Code modulated pulses (after sampling and quantization)	P3G	V3E (for example)	4.13 Colour N
	Cases not covered by the above in which the main carrier is pulse modulated	—	P9*	XXX† (for example)	4.15 Combination of the above W
					4.16 Cases not otherwise covered X
					5 Second symbol — Nature of multiplexing

#### NOTES

1. Emissions, where the main carrier is directly modulated by a signal which has been coded into quantized form (e.g. pulse code modulation) should be designated under (1.2) or (1.3).
2. This excludes time-division multiplex.
3. In this context the word "information" does not include information of a constant unvarying nature such as provided by standard frequency emission, continuous wave and pulse radars, etc.
4. This includes bandwidth expansion techniques.

#### EXAMPLES

##### Necessary bandwidth

The present method requires the necessary bandwidth of an emission to be indicated in kilohertz by up to three significant figures, the last being almost always a nought or a five. Thus for emissions with necessary bandwidths shown in the first column of Table 2 the corresponding designations will start with the number shown in the second column:

\*In most cases the type of transmission indicated by the number 9 in the old method can be more precisely defined by the new designations.

†The use of the symbols XX which define the nature of signals modulating the main carrier and the type of information to be transmitted should be used only in exceptional circumstances.



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TET HB35C log/yagi 10-15-20M 13' boom	\$360
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HY-GAIN TH3-JR yagi 10-15-20M 12' boom	\$220
HY-GAIN 411 yagi 10M 5 el 17' boom	\$110
HY-GAIN GPG 2.2M vert. 5/8W 3-4db gain	\$22
HF HELICAL WHIPS 10-15-20-40M each	\$25
HF HELICAL WHIP 80M	\$30

SPECIAL PRICE for set of whips w/boom mt & spring base **\$120**

### MULTIMETERS — DIGITAL

DT-810 LCD readout 16 ranges colour coded	\$100
DT-820 LED readout 16 ranges colour coded	\$85
DT-830 LCD readout 30 ranges (Sept. del.)	\$110
CC-01 Carrying case	\$7
UP-11 hFE probe	\$5
UP-12 IC Clip leads	\$5
UP-13 Universal test lead kit	\$8

### MULTIMETERS — ANALOG

DT-1311 19 ranges 20K ohm colour coded	\$30
DT-1313 19 ranges 20K ohm colour coded	\$35
DT-1314 38 ranges 50K ohm colour coded	\$40
DT-1316 36 ranges 50K ohm colour coded	\$45

### ACCESSORIES

CNA-1001 Daiwa 250W auto ant. tuner	\$250
MK-1024 electronic keyer w/programmable memories	\$195

POWER SUPPLIES 240V/13.8V DC: 2A regulated current limiting protection	\$40
4A regulated short circuit protected	\$70
6A regulated short circuit protected	\$85
ASAM type bumper mount	\$5
STANDARD bumper mount complete	\$5
HD SPRING MOUNT w/swivel ball mount	\$15
HD SPRING MOUNT	\$10
SWIVEL BALL MOUNT	\$5
HD GUTTER MOUNT 3/8" 24 thread base	\$8
MIRROR/ROOFBAR MOUNT w/base	\$6
MAGNETIC BASE w/cable & plug	\$16
MAGNETIC BASE w/out cable	\$15
STANDARD MARINE BASE	\$5
ADAPTOR 3/R stud	\$30c
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ADAPTOR 3/8 Male - 5/16 Female	\$1.00
COAXIAL 3-way push button switch	\$15.00
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2, 3 & 4 pin plugs or sockets	each \$1.20
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RG8/U quality coax cable 50 ohm per metre	\$1.25
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RG58A/U quality coax cable 50 ohm per metre	50c
RG58C/U quality coax cable 50 ohm per metre	60c
6 CORE Rotator Cable per metre	75c
BN-86 balun 50 ohm 1:1 1 KW	\$25.00
HI-Q balun 50 ohm 1:1 1 KW	\$15.00

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Yaesu-Musen, Trio-Kenwood and Icom equipment available plus accessories. Ring, write or call in for information brochures and prices.

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JD-110 SWR/PWR/FS (black) 1.5-144 MHz	\$35
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JD-140 Antenna Matcher 100W 25-40 MHz	\$45
JD-171 SWR/PWR/FS 1.5-144 MHz	\$40
JD-175 SWR/FS/MATCHER 1.5-144 MHz	\$55
JD-176 SWR/PWR/FS/MATCHER 1.5-144 MHz	\$55
JS-178 SWR/PWR/FS/MOD/MATCHER 1.5-144 MHz	\$55
JD-181 SWR/PWR/FS 1.5-144 MHz	\$20

NOTE: ANTENNA MATCHER RANGE 25-40 MHz ONLY

### MARINE TRANSCEIVERS

2W 3 ch. hand-held w/crystals	\$75
5W 6 ch. hand-held w/crystals	\$115
5W 6 ch. mobile w/crystals	\$135

### CONNECTORS

PL-259 RG-8U and RG-58U types	each \$1.00
SO-239 1, 2 or 4 hole mount	each .75c
RIGHT ANGLE connectors	\$2.00
T-Connector 3 x SO-239	\$2.00
T-Connector 2 x SO-239, 1 x PL-259	\$2.00
PL-258 double female 2 x SO-239	.75c
Double male 2 x PL-259	\$1.00
UG175/U reducer for RG-58U coax	.30c
UF176/U reducer for RG-59U coax	.30c
ADAPTOR RCA male to SO-239	.75c
LIGHTNING ARRESTOR PL-259/SO-239	\$2.00
MLS RIGHT ANGLE PL-259 to RG-58U	.75c
GLP RIGHT ANGLE SO-239 to RG-58U	\$1.00
M-RING car body mount 2 x SO-239	\$1.00
UG363/U 2" feed thru D/F 2 x SO-239	\$1.50

### N SERIES CONNECTORS:

N-type in-line plug	\$5.00
N-type cable socket for RG-213	\$9.00
BNC-CONNECTORS SILVER PLATED WITH TEFLON INSERT:	
UG88/U male in-line plug for RG-58U	\$2.50
UG1094/U panel mount socket	\$2.50
UG89/U in-line socket for RG-58U	\$2.50
UG914/U double female adaptor	\$4.00
UG4914/U double male adaptor	\$5.00
UG255/UBNC male to SO-239	\$2.00
UG273/UBNC female to PL-259	\$2.00
UG306/BNC Right Angle connector	\$3.50

ROTATORS — INFORMATION ON REQUEST

All prices are NET, ex Springwood and Crows Nest, on pre-payment with order basis. All risk insurance is free of charge, allow for freight charges by air, road, rail or post, excess will be refunded. Prices are subject to change without prior notice. All orders cleared on a 24 hour basis after receipt of order with payment.

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52.330 VK3RGG — Geelong  
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52.370 VK7RST — Hobart  
52.400 VK7RNT — Launceston  
52.425 VK2RAB — Gunedah  
52.435 VK3RMV — Hamilton  
52.440 VK4RTL — Townsville  
52.450 VK2WI — Sydney  
52.500 JA2IGY — Mie  
52.510 ZL2MHF — Mt. Climie  
52.600 VK6RTW — Albany  
144.010 VK2WI — Sydney  
144.400 VK4RTT — Mt. Mowbullen  
144.475 VK1RTA — Canberra  
144.500 VK6RTW — Albany  
144.555 VK5RSE — Mt. Gambier  
144.600 VK6RTT — Carnarvon  
144.700 VK3RTG — Vermont  
144.900 VK7RTX — Ulverstone  
145.000 VK6RTV — Perth  
144.400 VK2RCW — Sydney  
432.440 VK4RBB — Brisbane  
432.450 VK3RMB — Mt. Bunningyong

◊ Indicates a correction to location per Joe VK7JG.

The beacon listing is considerably longer this month. As we approach the equinox it seems fitting to have a more complete listing on six metres. It is interesting to note, however, that during periods when there is a possibility of contacts being made on six metres as a result of follow-up on 28.885 MHz, it is not uncommon for stations, particularly with keyers, to run them between 50.100 and 50.110. Cases in point were the South African stations, which were often heard around 50.107, so a listing of some of these keyers on a certain frequency should not be taken as definite.

Will someone please tell me if VK2RCW on 147.400 in Sydney is still operational? I removed it from listing once and was promptly told to put it back, so would appreciate some feedback on the position.

The only information to come in this month in regard to my request for beacon information has been from Tasmania via Joe VK7JG. Looks like it is going to take 12 months to get it all together. Shame on you!

## FROM TASMANIA

We don't often have any reports from down under, but Joe VK7JG, when sending along the beacon information, mentioned that six metres was very quiet at the moment except for occasional winter Es opening to the mainland. However, on 29/3/81 heard VP1A beacon on 50.090 at 559, same day heard ZF2DN beacon on 50.109 599 for nearly 2 hours. Worked KG6DX at 2252Z on 20/4, WA4TNU/KL7 at 0052Z on 24/4, H44PT at 2300Z on 26/4, F08DR at 2328Z on 30/4. Joe has now worked VK, VK0, ZL, JA, KG6, W6, KL7, YJ8, F08, XE1, HL9, HM, P29 and heard W7, W5, ZF2 and VP1. That's quite a good effort, Joe, why don't you get all the details together and let me have them so they might be forwarded to "QST" for inclusion in the 6 metre listings?

## VHF/UHF STANDINGS

"QST" does it, why shouldn't we? There don't seem to be any real reasons why VK should not have its own listings covering areas worked. On 6 metres it could be countries worked, e.g. VK1 to VK8 inclusive would be classed as one country, ZL1 to 4 the same, also JA, etc. But separate islands having, say, VK9 call signs would be counted as separate countries, as would all the various island territories throughout the Pacific and other areas. VK0 would be a separate country in several places.

Information required: Your call sign, date of application, country, call sign of station worked, band (state if 52/52, 52/50, 52/58), date worked, QSL received yes/no, propagation mode (Es, FT, tropo, EME, m.s., aurora, etc.), transmission mode (SSB, CW, FM, RTTY, etc.), your address, and any remarks you may care to add.

For 144 MHz and above the details required would be: Your call sign, date of application, call area, call sign of station worked, band, date worked, QSL received yes/no, propagation mode (Es, tropo, EME, m.s., aurora, etc.), transmission mode (SSB, CW, AM, FM, RTTY, etc.), your address, and any remarks you may care to add. (Note: Different call areas required here.)

I don't mind giving it a try and from time to time publish the listings, they could be of considerable interest. I do, however, reserve the right to ask anyone for more details of any contact, and if you are asked to produce a QSL or similar would expect you to do so, or at least in the first instance a photocopy of it.

By the time you read this the Remembrance Day Contest will be over, so why not give your VHF/UHF standings some attention? As mentioned last month, we have the entry from Steve VK3OT for starters on 6 metres with 26 countries, with 25 confirmed. A good effort. Who can beat or get close to it? And what about people like Rod VK2BQJ with his mass of 2 metre contacts, including to ZL! I suppose there won't be any prizes on the end of it, but it might be interesting to find out who are our top DX operators on the various bands. So go to it!

## WESTERN AUSTRALIA

Good to hear from Wayne VK6WD this month. He wrote firstly to comment on the rather large 6 metre opening between VK6 and VK3 and VK5 on 17/7/81. First seemed to start about 0556Z with a call on 52.050, which was answered by VK5AS, then followed by VK5KK, VK5LP, VK5ZWZ, VK5ZBU, VK3AUI, VK5ZDR, VK3AMQ, VK5AGM and VK5ZRO. Signals varied between S3 and S9+ as the opening waxed and waned throughout the two hours the band was open. One of the best winter 6 metre openings to VK6 for a long time.

During the opening Wayne mentioned the reception by Tony Mann of the Adelaide FM stations, details as follows: 0600Z 92.9 MHz, 0620Z 107.5 MHz, with both stations full scale on the meter using whip antenna! Both stations lost at 0640Z. No

## VHF/UHF BEACONS

Freq.	Call Sign	Location
28.230	ZL2MHF	Mt. Climie
28.260	VK5WI	Adelaide
28.262	VK2WI	Sydney
28.885	W6IRT	California
50.005	H4HIR	Honiara
50.020	GB3SIX	Anglesey
50.023	H22PR	Haiti
50.025	6Y5RC	Jamaica
50.035	ZB2VHF	Gibraltar
50.036	HC1JX	Quito
50.038	FY7THF	French Guiana
50.040	WA6MHZ	San Diego
50.048	VE6ARC	Alberta
50.050	Z3SE	South West Africa
50.060	PY2AA	Sao Paulo
50.070	YVZZ	Caracas
50.070	VP9WB	Bermuda
50.080	W1AW	Connecticut
50.080	T12NA	Costa Rica
50.085	WA6JRA	Los Angeles
50.088	VE1SIX	New Brunswick
50.089	WD4CEJ	North Carolina
50.100	KH6EQI	Pearl Harbour
50.104	K4EJO	Tennessee
50.105	KCA4AD	McMurdo, Antarctica
50.106	ZS6LN	South Africa
50.110	KHOAB	Saipan
50.110	KHOAB	Saipan
50.110	AL7C	Anchorage
50.120	487EA	Sri Lanka
50.144	KC6NI	Caroline Is.
50.498	5B4CY	Cyprus
51.022	ZL1UHF	Auckland
52.013	P29SIX	New Guinea
52.150	VK5KK	Artherton
52.200	VK8VF	Darwin
52.250	ZL2VHM	Palmerston North

sign of Channel 5A or Channel 3 TV from SA. Looks like the MUF was really creeping up that time.

For your interest Wayne mentioned the Perth FM stations are on 92.1 MHz 6UVS, 96.1 6NOW, 97.5 6ABC, with Channel 5 TV sound on 107.750.

Wayne reports reception as follows from South Africa: 18/5 0809Z ZS6DN 50.054 5 x 1, beacon only. 0828Z ZS6LN 50.106 5 x 3 in QSO with VK5ZK; 0831Z worked ZS6LN (50.106) 5 x 1 with VK6WD (28.885) 5 x 4; 0849Z ZS6LN (28.885) 5 x 7, to VK6WD (52.005) 5 x 1 to 5 x 2; 0849Z ZS6LN (50.106) 519 to VK6WD (52.005), 519, unconfirmed. 0833Z ZS3AK 50.105 5 x 5 x beacon only; 0915Z ZS2SS 50.112 5 x 1 very briefly. Good work, Wayne, at least you have been sharing in some of the contacts which had earlier been started in VK5. Wayne also reported no 6 metre DX between 19/5 when KH6EQI was 5 x 5 and the Es opening to VK3 and VK5 on 11/7, so obviously very quiet in the West. Thanks, Wayne, please write again.

## MELBOURNE

Gil VK3AUI writes to say he has received a letter from Rolf PY1RO, who is temporarily off the air whilst relocating his station, and included details of the PY2AA beacon on 50.060, which runs 20 watts to a vertical antenna located on top of a tall building in Sao Paulo. The beacon was formerly that of Fred PY2XB, who has two phone numbers, viz., 5511-241-5695 and 5511-542-4364. Rolf PY1RO is 5511-222-8844. Fred PY2XB lives in the same town as the beacon and is active on 6 metres.

Gil also reports further FM reception having been made in Mar Del Plata, Argentina on 10/5/81 around 2345Z of the Melbourne station EON on 92.3 MHz. It seems the station has received a cassette recording of their signal which was submitted by a listener using an FM dipole and FM broadcast receiver. This may be the same listener who recorded signals from 3FOX in Melbourne at 0829Z on 13/9/80, as the Argentine area is the same. Interesting.

## CHANNEL 0

My spies have informed me that Channel 0 in Brisbane has just recently bought a new transmitter! If correct, so much for any hope of one less 0 station. I note also

CRUD 0 in Melbourne has shifted the sound frequency to 51.750 MHz, which is the same as that of the Brisbane station. Might be interesting to see what happens during an Es opening now. Or maybe the new Brisbane station will be using the offset formerly used by Melbourne; time will tell I suppose.

## SIX METRES IN UK?

Graham VK6RO has sent me an interesting editorial from "Mobile News", the journal of the Amateur Radio Mobile Society in the UK. In part it reads: "SIX METRE MOBILE: British members may know that since May last year a beacon, GB3SIX, on 50.020 MHz, has been operating from the island of Anglesey in North Wales, between 0100 and 0830 local time, the restricted hours due to television broadcasting in Band 1.

"The latest development is that two dozen British amateurs have been offered permission to operate on the six metre band outside TV hours, a fact which emerged at the recent VHF Convention at Esher in Surrey. The way this information came to light has come in for strong criticism, particularly from many keen VHF folk who were unaware that anything was in the offing.

"Roy Stevens G2BVN, the RSGB's Telecommunications Liaison Officer, subsequently telephoned us to relate the authentic account and stated that, for its part, the Home Office seems quite willing to grant a six metre licence to all Class A licensees right away. However, the present incumbent of Band 1, the BBC, appears to be hanging on grimly to its allocation, even though all Band 1 TV will be closed down by the middle of the decade.

"Roy explained that this is a foot-in-the-door approach and if, after a few months, there are no complaints of interference, there would seem to be every possibility that the six metre band will be made available to all, initially on a restricted hours basis."

Good luck to the British boys, I hope they get their allocation, it may even lead to other countries in Europe following suit.

## STATION ADDRESSES

Neville VK2QF asks about the considerable list of VK0 stations appearing in VK6XI column of AR and what their 6 metre capa-

bilities may be. As far as I know there is not much being done in this regard, which seems a pity. I will ask around in the meantime.

Neville also asks for some QSL information to be published from time to time. That's quite a good idea in view of the quite considerable contacts made with overseas stations on 6 metres. Here are some addresses to start with from my pages.

KG6JDX: Joe Manusco, POB 20732, Guam.  
KG6DX: Joel E. Chalmers, AFCE OL-AD (141), APO, San Francisco, California, USA 96334.

H44PT: Peter Taylor, PO 81, Honiara, Solomon Islands.

XE1GE: G. W. Lord, APTO No. 875, Cuernavaca, MOR, Mexico.

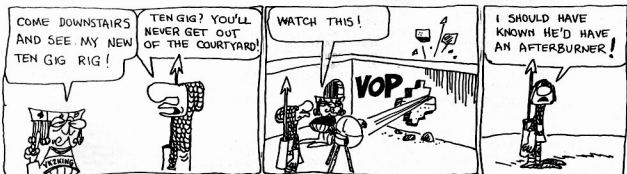
XE1TIS: Kenneth M. Price, PO Box 337, Irapuato, Gto, Mexico.

FO8DR: Rene Del Amare, Route Del Pointe Venus, Mahina, Tahiti, French Polynesia.

Next month I will try and have a few more for you and this may assist in obtaining your QSL. Don't forget to include at least two IRCs, possibly three, for a prompt airmail reply, because the operator at the other end may not be that interested in you unless you are a rare contact for him. Most will reply providing you proceed properly and recognize that the load on his finances might be heavier than on yours because he may be a rarer contact. Play it safe if you really need his card by including adequate postage.

Neville makes a suggestion about slightly mutilating the postage stamps to ensure they get through the postal system at the other end. That's one possibility, I suppose, as I have lost some stamps from letters on route in the past. However, as a stamp collector I think I would prefer to take the chance and most times receive an intact stamp which can be safely removed than having a damaged one. Possibly the operator at the other end would feel the same about the stamps I attach to my letter!

The important point of all this of course is that if you badly want a card you will have to pay something extra in the way of airmail postage to get it. Certainly never



rely on a bureau as many overseas stations do not use them or do not have access to them, the direct QSL is the only way. The VKSLP return rate from overseas QSLs has been quite good, there are very few misses even from the JAs.

There are those operators of course who have QSL managers. Follow their instructions if this is the case and don't send direct. Often lists are shown in Amateur Radio and Amateur Radio Action of QSL managers for various stations — if you see one you have worked or want to work then write the details down safely otherwise when you want it you won't know where to look!

#### SIX METRES IN GENERAL

Most activity during the past month has been confined to occasional Es openings from VK5 to VK2, VK4, VK6 and VK7 and ZL. It is quite surprising the number of times ZL TV stations can be heard at quite good strength but no amateur signals. There is nothing to really report as being exceptional in any of these openings being the usual winter time Es.

It is significant to note, however, that even the Northern Hemisphere is taking a rest from their frenzied activities of the past two years, and having to be content in the main with their summer Es openings. Bill Tynan in "World Above 50 MHz" in July QST reports a number of good openings to Argentina during April from the USA, and comments that Peter YJ8PD had to wait two years to work the US on 6 metres, when he finally did on 12/4 with

W6XJ, and on 16/4 to KD6R, WB6NMT, K6DYD and a number of other 6s. Good luck, Peter, but you are doing better than I am. I still wait for a contact confirmed to the US after many more years than two!

#### GEELONG AMATEUR RADIO CLUB

Congratulations to that very active body of amateurs in Geelong, and I mean active. Their July newsletter shows no less than 15 meetings or some other activity between 17th July and 2nd October, and the range of subjects covered is considerable, and should be capable of satisfying most of their members. The Club's activities list certainly puts to shame a city like Adelaide, where it is difficult to find anyone sufficiently interested to make a move to get the beacons back on the air, the work having to be left to the same ones every time.

#### CONCLUSION

These notes are being prepared several days in advance of the usual closing date to allow for a slow delivery by Australia Post due to industrial action. Thus anything which comes in the next day or two might not make the deadline.

I noted in the June issue of the South East Radio Group (Mt. Gambier) Newsletter a hint regarding a soldering aid. They say a dental pick makes a good de-soldering tool, you can relieve holes, clear tracks and prise the lead away from the board, etc. Ask your dentist for a worn out one.

Good DXing during the equinox, there should still be some good long distance six metre contacts around, especially in the mornings. And we do not yet know

whether September/October might even be a better time than March/April for contacts between VK and Africa and/or South America. African contacts to the south will be late afternoon contacts (local time), so be alert. Watch out for the South Africans on 28.885 in the first instance, and for their keyers around 50.106 MHz.

Closing with the thought for the month: "Success without honour is an unseasoned dish; it will satisfy your hunger, but it won't last good."

73. The Voice in the Hills. ■

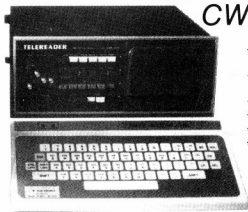
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# CONTESTS

Reg Dwyer VK1BR  
PO Box 236, Jamison 2614

## CONTEST CALENDAR

### September

6 Bulgarian CW	CQ 7/81
12/13 European Phone	CQ 6/81
19/20 VK Novice	AR 8/81

### October

3/4 VK/ZL Phone	AR 5/81
10/11 VK/ZL CW	AR 5/81
17/18 Jamboree on the Air	
24/25 CQ WWDX Phone	

### November

8 & 22 Czechoslovakian Phone/CW	FCM
14/15 European RTTY	
28/29 CQ WWDX CW	

## RULES

### BULGARIAN CW CONTEST

Classes: Single operator, single/multi-band, multi-operator/club and SWL.

Bands: 3510-3590, 7005-7040, 14010-14090, 21010-21125, 28010-28125 kHz, CW only.

Exchanges: RST plus ITU zone.

Scoring: Six points for contact with an LZ station. One point for station on same continent and same country. Three points for stations in all other areas.

SWLs: Three points for report on both stations in QSO. One point if only report on one station.

Multipier: Sum of ITU zones worked on each band.

Final score: Total QSO points multiplied by sum of ITU zones worked on each band.

A separate log is required for each band, together with a summary sheet showing the scoring and zones worked on each band and the usual declaration of participation is required.

Logs to be sent by 30 days after the end of the contest. Send to BFRA Contests, PO Box 830, Sofia 1000, Bulgaria.

Good luck.

73. Reg VK1BR.

## CURRENT OFFICIAL AMATEUR SERVICE HANDBOOK STILL AVAILABLE

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Regrettably there have been delays to imports caused by industrial disputes but there should soon be some hope of returning to normal.



Deliveries of VHF Communications from overseas have been subject to long delays with one result being the lack of back issues.



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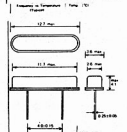
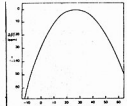
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| 4. Series Resistance            | 31.0 kΩ max.                                |
| 5. Q Factor                     | 40,000 min.                                 |
| 6. Parabolic Curvature Constant | Less than —0.04 ppm/°C (Refer Fig. 1)       |
| 7. Turnover Temperature         | 28.0°C ±5°C                                 |
| 8. Capacitance Ratio            | 700 max.                                    |
| 9. Storage Temperature Range    | —30°C +80°C                                 |
| 10. Operating Temperature Range | —10°C +60°C                                 |
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# AROUND THE TRADE

## SCALAR INDUSTRIES RELEASES NEW PRODUCT FROM TEN TEC

The Scalar Group also advise arrival of a new Model 209 dummy load from Ten Tec. Technical details are:—

The new Ten Tec Model 209 air-cooled RF dummy load is an excellent accessory for the ham shack or test bench. It allows transmitter operation for testing or alignment without a disturbance to other amateurs on the air.

Model 209 is rated at 300 watts for 30 seconds with derating curve for extended use. VSWR is (2.1): 1 maximum from 0-30 MHz, 1.5:1 maximum from 30-150 MHz. The dummy load is housed in a perforated aluminium enclosure, dark painted for excellent heat dissipation characteristics. SO-239 connector is built-in for convenient installation.

Specifications: Power rating — 300 watts for 30 seconds, derating curve to 5 min. VSWR — (1.1): 1 maximum 0-30 MHz, 1.5:1 maximum 30-150 MHz. Size — HWD 1 1/4 in. x 2 1/4 in. x 6 1/2 in. Weight — 1/2 lb.

For further information contact one of the Scalar offices in Melbourne, Sydney, Brisbane or Perth. ■

## TEN TEC ANTENNA TUNERS FROM SCALAR INDUSTRIES

The Scalar Group announces that the two Ten Tec antenna tuners, Models 247 and 277, have been superseded by the release of 227 and 228.

Technical details are:—

A 47-tap toroid, two inches in diameter, with silver-plated 18 gauge wire and tap selector, is the heart of this tuner. Used in a wide range "T" network with variable capacitors, it permits vernier tuning for easy, accurate adjustment. A front panel five-position antenna select switch offers a choice of dummy load or one of three antennas. One antenna may be bypassed around the tuner circuits if desired. Also one may be a long wire. Model 228 will match the conventional 50-75 ohm unbalanced output of transmitters or receivers to a variety of load impedances. A built-in balun converts one antenna to a balanced configuration if desired. Antennas such as dipoles, inverted "Vs", long random wires, windows, beams, rhombics, mobile whips, zepp, Hertz and similar types can be matched over a frequency range from 1.8 to 30 MHz. Power rating is 200 watts, RF, intermittent; 100 watts continuous. A built-in SWR bridge and meter indicates ratios between 1:1 and 5:1. Housed in an attractive aluminium case, Model 228 is an ideal accessory to any transceiver with input power up to 200 watts.

### Model 227 Antenna Tuner

This is identical to the Model 228 but without the SWR bridge. Styled to match Ten Tec delta and omni transceivers.

For further information contact one of the Scalar offices in Melbourne, Sydney, Brisbane or Perth. ■

## NEW PRODUCTS FROM DICK SMITH 24 HOUR QUARTZ WORLD CLOCK

This new Yaesu 24 hour quartz world clock enables you to know the time anywhere in the world at a glance. It is available from all Dick Smith Stores.

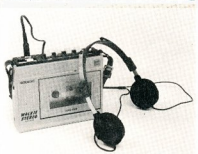
For amateur radio enthusiasts the 24 hour clock takes the guesswork out of trying to contact people overseas. It has an attractive simulated walnut finish and can be hung on the wall or attached to its supplied stand. It represents good value for money at \$49.50. The Yaesu world clock uses one "C" cell battery, which is supplied and, of course, it is quartz controlled for accuracy. ■



## WALKIE STEREO CASSETTE PLAYER

Now you can listen to your favourite pre-recorded stereo cassettes wherever you are with this new compact player. The Dick Smith Walkie Stereo, Cat. No. A-4055, is supplied with super lightweight stereo headphones ideal for joggers, golfers, walkers or anyone on the go. And it has two telephone sockets so you can share this stereo sound with a friend. The neat little play unit has a tone selector to suit the listener and, to protect the tapes from damage, there is an auto shut-off mechanism.

The Walkie Stereo also incorporates a "Talk" button for when you want to talk to a friend — you can actually hear your friend's voice through the headphones. Cost \$99.00. ■



## SOUND TRIPPER I

This is not just a portable radio. Equipped with high quality, lightweight headphones,

this little FM/AM receiver is ideal while walking, playing golf, working and even jogging. The clear, precise sound will keep you in touch with music or news wherever you are. The clip-on attachment saves the necessity of carrying the Sound Tripper I and with the dual volume control you can adjust the sound to suit your individual taste. A second set of headphones may be added so a friend can also tune in.

The Sound Tripper I, Cat. No. A-4330, is available from Dick Smith stores and costs \$49.50. ■

## HY-GAIN V-2

Audio Telex announce the new V-2 2m antenna.

### SPECIFICATIONS

#### Electrical:

Of particular importance is the gain spec. The gain of 3 dB, using a dipole reference, and 5.2 dB, using an isotropic reference, is the best you can do with antennas of this size and type. The most common problem with an antenna design of this type is inadequate isolation of the coax shield. RF comes back down the shield of the coax, resulting in gain robbing distortion of the radiation pattern. Telex engineers have isolated the feedline shield by using the unique dual radial system. Electrically the V-2 is outstanding.

The bandwidth of the V-2 antenna is also significant — at not less than 7 MHz under 2:1 VSWR. The entire 2m band is covered and no tuning is ever required.

#### Mechanical:

The mechanical design of the V-2 is also outstanding. It can be put together in about 20 minutes, and it will survive even the meanest thunderstorm. The feed point is weather protected and accepts a standard PL-259 connector. The mounting bracket clamps to any mast diameter up to 2 inches (51 mm). That means that it will easily mount on any commonly used tower mast.

The V-2 can be quickly taken apart at the centre by loosening one clamp. It is therefore easily transportable.

### 150 MHz Land Mobile Use:

The V-2 is supplied with dimensions for use from 138 MHz to 174 MHz. This covers the 150 MHz land mobile band.

### CONCLUSION

The V-2 represents a great deal of thought and planning and should prove very popular. ■

## THE NEW FT ONE

The Yaesu Musen Co. Ltd.'s new HF Station will be here soon. The new FT ONE is said to be the ultimate in design, functions and accessories — it "has everything".

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# TRY THIS

WITH THE TECHNICAL EDITORS

## FULL BREAK-IN CAPABILITY (QSK) FOR 520S

Mr. G. Donk VK2VPD/7  
Investigator Hall, Box 788, Launceston,  
Tasmania 7250

When you send CW, and finally have a break because your arm is almost falling off, you will have found the annoying experience that the person at the other end tells you after the third word and wants a repeat. This of course does not happen if you are using split frequency and a separate receiver, but not many of us work in this fashion. If your transceiver were to switch back to receive every time the key was not held down, you would be able to hear him the instant he pushed his key when he tried to signal you to stop. In commercial traffic handling this is done, and the moment you hear a tone in between your dits and dahs that you know you didn't produce you stop and listen. But unfortunately most amateur transceivers when used in the VOX mode still have too long a delay constant even in the most sensitive setting when the VOX delay is at minimum.

This problem can be cured. I own a Kenwood 520S, and if you have one, too,

you might like to make the modification shown. The VOX delay system works more or less on the principle of a time constant being produced by an RC circuit, and the length of this time constant (T) may be shortened by decreasing the value of either the resistor or the capacitor. The manufacturer has chosen to vary the delay by the use of a small potentiometer because it is easier and cheaper to put in than a variable capacitor. But this pot still has quite a large amount of resistance even when set at minimum, and unfortunately the pot cannot be substituted with one of a lower value because if the resistance drops too low then Q6 will take off.

What I did was to remove C10 on the VOX board (refer Fig. 22 in manual), the 3.3 uF capacitor, and replace it with a 1 uF cap. But one bit of care must be taken in selecting the right type. The existing cap is rated at 50V but when a smaller cap is put in its place the voltage across it increases somewhat. I replaced it with a 1uF greencap (250V) and this seems a little large in size at first but there is plenty of room in that part of the transceiver. If you do on the other hand decide to replace it with another electrolytic, then make sure

that you observe the correct polarity.

I have been using this system for a number of months now and it has made the world of difference. I no longer have to repeat large slabs in CW because I now tell the other party that I have full QSK so that I can hear him the instant he butts in even if I am half through a single letter. Another advantage is that if a third party wants to join in he does not have to wait and wait for that elusive break in the conversation. If he puts his call in I will stop and listen.

The modification on the 520 only takes about 5 minutes when you have removed the top cover, and that is only held on with eight Phillips screws anyway. You will find the board in question just next to the small removable panel which houses the VOX controls on the left-hand side.

The number of the board is X54-0001-00 and the schematic diagram may be found on page 32 of the operating manual. To make things simpler still, there is a photograph showing the position of the VOX unit on the back of the foldout sheet. The diagram given should clear up most problems anyway. — (From the Propagator, June 1981.)

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# HOW'S DX

Ken J. McLachlan VK3AH  
PO Box 39, Mooroolbark 3138

## BURMA

The months of June and July as far as the Oceania DXer is concerned will probably be remembered in years to come as the period when you spent many hours monitoring a couple of frequencies to work XZ and, whilst doing so, were thoroughly educated in oriental psychology by their approach to list taking to a world-wide pile-up that appears when a country hasn't been active for nearly twenty years.

The Californian kilowatts roared into action, manners and operating ethics were thrown to the wind, back chat and obscenities were in excess of the contacts made, and the reports were very poor.

If your call sign came out in the lottery the four colour card will be in your hands or on its way by now. If you sent yours off direct (mine arrived late July), that is, if you weren't one of the unfortunate ones whose call sign missed the log and apparently it could have happened.

Accreditation as to whether XZ5A or XZ9A will be accepted for DXCC is a little cloudy due to a number of questions which have to be answered. Some of these are: Will the Central Administration of Burma recognise the Regional Government of Kow Thoo Lei, who issued the licence? The licence was issued to Mr. Fukuta (JA8BMK) and Mr. Shimaya (JA8BKM), so why Sanplo the operator? JA8BKM and JA8BMK being based in Japan. The licence was issued for 24 hours. Why was this exceeded? Are there additional permits or extensions or has another licence been issued? Sanplo and Laydoh speak excellent English and are both in the military operation over there, so it must be a joy to have such modern equipment to play with.

These and other questions have to be answered before any of us lucky enough to have a card can say that is one less in the paperchase.

To make life a little more interesting 9U5JM appeared with the ANZA net (21.204 MHz 5.00 UTC daily) in the middle of July. This was one of the stops by Professor Ed W4MGN of Georgia University during his whirlwind tour of Africa.

Some 155 VK and ZL operators made the grade, however the exercise brought the "best" in some participants to the surface.

There were the "queue jumpers", "Wanta work it on CW?", "You missed me" operators talking over the top of Ed, which I feel is very discourteous, particularly to the DX station, and the person who is trying to run the list. Also it doesn't create any confidence in a prospective DX expedition thinking of joining the frequency in the future.

## DX NET OPERATIONS

The popularity of DX net operation is on the increase, and the debate as to whether they are good or bad is also heating up. I am not going to enter into it in this column, however for those stations that partake or may wish to join a net, the following may help you and the net controller:—

### DO:—

- (a) Check in ONLY when your call area is asked for.
- (b) Abide by the controller's instructions.
- (c) Make your calls smart, precise and give the signal report (5 and 0 is not a report).
- (d) QSL your report by repeating it and pass it back to NC.
- (e) Count the report only when necessary.

### DON'T:—

- (a) Tune on frequency (build or buy a dummy load).
- (b) Call out of turn.
- (c) Talk over control or a station calling.
- (d) Call more than two stations.
- (e) Repeat the signal reports of another station.
- (f) Ask for QSL information until all the stations on the list are cleared.

Basing your operating technique on the above will allow you and other members to enjoy the time spent and work more efficiently, also relieving a lot of strain from the master of ceremonies.

## POSTAL AND IRC COSTS

July 14 was price rise day for Australia Post, internal mail up 2 cents, external mail no change, but IRCs up 15 cents to 60 cents, surrender value 40 cents. In the USA IRCs are now 65 cents with a surrender value of 35 cents. US mail to VK is 40 cents.

Therefore it is a lot cheaper to us and more profitable to the DX station to receive a "green stamp". An American dollar, which is readily available, costs 84 cents and I have used this method for three years with a 100 per cent return.

## QRM

Have you been QRM'd whilst trying to work that rare DX station? Well administrations are doing something positive about it. The FCC just recently caught somebody doing just that and they relieved a W1 and W4 of their licence and equipment permanently, which was a very costly error. Also it is believed the ZL authority has made efforts to relieve tension and possible problems on certain frequencies.

## DX JOTTINGS

V59K: Very high on the wanted list, was due to appear on the 30th July. The proposed operation was in the lands of JA1AFD.

4W: Fact, fiction or straight out rumour, but a JA was reportedly due there for a stint in late July.

5A Libya: The G3JK/5K card you received is still a no no at Newington,

however there are hopes for an EA operator to go there in the near future. Prompt QSLing and being good for DXCC would make anybody that worked it very happy.

IA0KM: Knights of Malta. ARRL DX Advisory Committee recommended it as a new country, being number 319, however it is believed the Directors have put it aside for the present. Pity, as it is a very nice card.

VK4AFH/LH: Ron ZL1AMO was very popular during his stay, which apparently was a big success, and CW took a big share of the log. QSL direct to Ron ZL1AMO.

ZL3AFH/A: Warrick has had his share of problems, the latest being his final tubes, but new ones are on the way via an air drop, also he still doesn't know if his time extension has been approved for his stay till next April. QSL route via ZL2HE.

VK9NYG: Frank on Cocos Keeling is getting into the swing of DX and keeping his QSL Manager, Neil VK6NE, occupied. Being restricted to the novice bands doesn't assist the eastern States as Frank is generally found on 28.480 MHz at 11.00, 13.00 and 15.00 UTC.

Neil VK6NE is looking to beg, borrow or preferably buy an external VFO to suit the FT101E which Frank uses in conjunction with a ATN log, periodic beam for 21 and 28 MHz. Any helpers with a VFO type FV101B?

Herik FR0FLO on 10 metres told me he was planning an expedition to Juan de Nova in September, with a duration of ten days.

Moussa 3B8AE/3B9 is using a TS120S and a two element beam at 20 feet for 20, 15 and 10, plus an inverted vee for 40 metres. QSL to the home call, replies will come when he returns, probably October.

C31WW was Gordon VK2DGS operating at TS130S, FL2100 and a multi-band dipole at 30 feet. Nice signals into VK and ZL on 20 and 15. QSL to home call.

## RECIPROCAL LICENCES IN "G" LAND

Can be easily identified as they begin with a prefix of G5 and have a three letter suffix, whereas in ZL the figure 0 is used, followed by the allocated call; both are evidently irrespective of call area.

## ROYAL WEDDING

GB2WED was one of the few special event call signs allocated for the Royal Wedding — another one being GB2RW. Both are believed to have special QSL cards.

Navassa HH2N: Very active on most bands, though rumours state no permit to land was issued by the Coast Guard who control that area — thus an illegal operation if you worked it. QSL to WD4JNS.

## GOOF DEPARTMENT

7Q7LS quoted last month should have read 7Q7LW. Les has been around on 21.204 MHz, making quite a lot of VKs and ZLs happy.



# MALAWI

Bob WA4SKE was to visit Malawi in the middle of August and hoped to present Les with new finals, also to operate from his QTH. It has been reported that amateur radio in Malawi is illegal under the present administration.

# NORFOLK ISLAND

The Norfolk Island postal staff are slowly getting used to the popularity of Kirsti VK9NL and OM Jim VK9NS since they have got into gear, but the ZM7 QSLs will bewilder them as they arrive by the bag full.

Kirsti, prior to becoming an amateur a little over 12 months ago was a commercial operator, and now shares the Icom 720, linear and Wilson 6 element beam with Jim, also there is a phased four element vertical on 40 metres which makes the Europeans very happy according to reports heard.

Amongst other goodies in the shack there is some slow scan gear which they may press into service when space and time are available, but VK9N is really coming off the wanted list on CW and phone, and the prompt about turn on QSLs keeps the multitude happy and there might be some island hopping by the duo this month in the Pacific.

# LIGHTNING STRIKE

The hard luck story this month must go to YS9RVE, patiently waiting his turn to work 9U5JM for a new country. A lightning strike took the power out; it came back on when all the action was over and Ed had gone.

Commissions, Bob — better luck next time.

# THINKING OF GOING ON A DX-PEDITION?

Well the West Coast DX Bulletin has done

a survey for your interest. Here are the top 10 most wanted in North America:—

(1) China By, (2) Andamans VS9IC, (3) Burma XZ, (4) Albania ZA, (5) Laccadives VP/L, (6) Heard Is. VK0, (7) South Yemen 70 (due september 1981, further details later), (8) Kampuchea XU, (9) Crozet FB8W, (10) Bouvet (3Y). How many of these do you want?

If you worked a new country last month why not celebrate by joining up a new member for the WIA. There were a lot of new countries worked!

Thanks to VKs ZDPN, 2DXM, 6IH, 6FS, 6NE and Eric L3-0042 for their help and support.

Hope new ones come your way this month.

73. Ken.

# LISTENING AROUND THE CW BANDS WITH ERIC L3-0042

160 metres: ZL1MY.

80 metres: KP4KK/DU2, KR6Q/OH00, KS6O/OH0, SP5HJJ, UK1AFA, VA9CRF, VK4ANS/LM, VK9NL, W6PYV.

40 metres: C3INM, FM7BZ, FO8HA, HC4BB, HC7CM, H13PC, HK3YH, HLBAT, IT9ZGY, LU9EIE, XT2AW, ZS5MY.

20 metres: EA9EO, FB8YH, FO0NP, HC4WA, HK0ZO, LU8DQ, SP2AOY/OA4, VS5RP, VP2AZG, 3B8DB, 7X2SX, 9VITL.

15 metres: CR9UT, FO0FS/M, HL9TX, KP4V, ST0SA, SV0AA/5, VK4ANS/LH, VS5RP, VU2PAP, YB3MD, ZS5YN, 4X4VL.

10 metres: MA1XEK, KH6NO, VS5RP, YB0BRT, ZS5YN, ZS6AEI.

# QSLs YOU MAY REQUIRE

9X5MH Ed, QSL WA4VDE.  
9U5JM Ed, QSL WA4VDE.

VE1BL/1 St. Paul's DXpedition, QSL W3HNK.

DL2VK/ST3 Reiner, QSL DF9FM.

3D2FL Bert, QSL VK3HSE.

A9XXD Jerry, QSL K7VDK.

EP2TY Paul, QSL JR3WRG.

SU1AA Eman, QSL Box 109, Giza, Egypt.

CO7AM Frank, QSL Box 44, Avil, Cuba.

CH2FOU, QSL VE2BCC.

T19VV Victor, QSL T12EY.

T19FAG Fernando, QSL Box 1, Hatillo

1300, Costa Rica.

A4XIU Brian, QSL G4FIR.

WB0IC/KH7 Dave, QSL W6FBN.

N6YK/VP2A Guy, QSL N6NK.

VP2MDG, QSL W6FDG.

TU2HS, QSL DJ9HD.

VP2MH Arnold, QSL W8HM.

GU5DYP, QSL DL8FL.

CR9UT, QSL Box 798, Macau.

C3INM, QSL PA0GIN.

FO0FS/M, QSL KS6EV.

FO0NP, QSL OH2NP.

FB8YH, QSL F3KM.

HC7CM, QSL N5BET.

II7ET, QSL I7RJO.

HK0ZO, QSL PO Box 632, Cartagena,

Columbia.

KR6Q/OH0, QSL K6TMB.

9K2FF Bob, QSL SV1TG.

EL2AG Ted, QSL WA4VDE.

HC8KA Ted, QSL HC5KA.

VQ9AA Reg, QSL AJ3N.

The photograph in August AR's column was NOT Ken, but Don VK2DXH, mentioned in text.

Sorry, Ken — but if you send us one of you, we won't do it again.

(VK3UV — Ed.)

# AMSAT AUSTRALIA



R. C. Arnold VK3ZBB

There is no certainty on the operating status of OSCAR 7, which has not been heard since early June. There are some suggestions that some signs of the beacon have appeared at a lower than designed frequency but these have not been confirmed. Meanwhile, operations on OSCAR 8 have increased to make up for the loss of AOT.

OSCAR 8 is working well and is fully controlled according to its planned programme. Unfortunately, I have been unable to obtain and process updated orbital information in recent weeks, and forward predictions on the old data is subject to too great an error. Hence no predictions for September unless some figures turn up at the last minute.

# UOSAT

The latest information is that the NASA Delta 2310 rocket (two-stage plus three solid castor — 11 booster) carrying a Solar Mesosphere Explorer spacecraft and UOSAT will be launched on September 15th at 11:41 GMT. An earlier date of launch is just possible but the time will be the same.

Separation from the Delta vehicle should take place over the Sudan, North Africa, at 12:52Z, assuming a nominal launch.

UOSAT is a complex amateur spacecraft which will require considerable post-launch activity to assess the performance of the on-board experiments and service modules. It is unlikely that the s/c will be activated for operational use for at least four weeks after launch.

The gravity gradient boom — some 18 metres long — will take three or four days

to deploy and the manoeuvre to acquire gravity gradient "lock" may take three weeks.

Telemetry will be available on the two data beacons (145 and 435 MHz) during the commissioning phase, most probably at 1200 b.p.s. NBFM.

One area of uncertainty still remains on the SSTV experiment. It concerns the exposure settings for the CCD slow scan TV camera experiment. It appears that despite all the meteorological spacecraft launched to date, it has proved impossible to obtain quantitative data on the amount of illumination which may be expected from the earth below. Limited exposure control is possible through ground control once the s/c is in flight but it is desirable to preset the "stop" to a midway position for the anticipated illumination prior to launch. Detail courtesy AMSAT-UK.

The following predictions are based on the latest information available and should be reasonably accurate in September:—

# SEPTEMBER 1981

## OSCAR 7

Date	Orb. No.	Eqz. Z	Eqz. W	OSCAR 8 Orb. No.	Eqz. Z	Eqz. W
5	31118	0041	91.7	17849	0124	84.6
12	31206	0116	100.6	17846	0013	87.0
19	31294	0151	109.5	18044	0046	75.3
26	31381	0030	89.6	18142	0118	83.3

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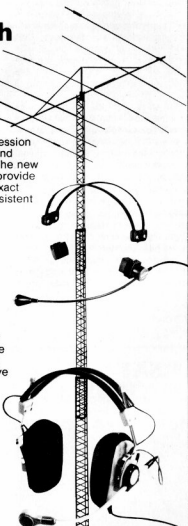
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# NOVICE NOTES



Edited by Ron Cook VK3AFW

Well we have a mixed bag this month. Firstly an aerial that offers the city-dwelling 80m operator a reasonable sized structure with useful efficiency. For those people who want an "invisible" aerial this might be the answer.

## LOW COST LOOP

This aerial was first described by James E. Taylor in *Electronics*, April 12, 1971. It is built as a vertical loop and fixed to the side of a wooden building. RG8/U was used, not because it was coax, but just to provide a cheap large diameter conductor. The original aerial operated at 3.94 MHz and had a 1.5:1 VSWR bandwidth of 100 kHz. That is the operating frequency could be varied  $\pm 50$  kHz from resonance before the VSWR rose to 1.5:1.

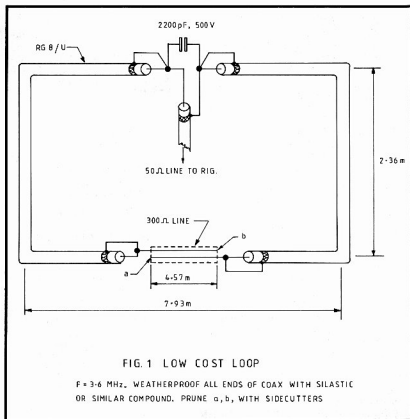
The aerial may be thought of as a short half-wave dipole bent to form a loop and brought to resonance by a capacitor across the ends. This capacitor is made from 300 ohm feeder because this is a cheap convenient form of high voltage capacitor which can be easily adjusted by snipping a little off parts "a" and "b" in Fig. 1. The capacitor should be pruned until resonance is achieved at the required operating frequency. A dip meter will be found invaluable for this.

Once resonance is obtained the VSWR can be reduced if desired by varying the 2200 pF 500V capacitor which is in shunt with the feeder. There may be further adjustments required to the 300 ohm line as such interaction can be expected between the two capacitors. A VSWR less than 1.5:1 will give satisfactory operation. The dimensions shown are for a nominal 3.6 MHz.

Signals will be about 10 dB down compared to a full size dipole.

## SIMPLE METER CALIBRATION

To calibrate a meter first catch a meter calibrator. If you can apply known voltages to a voltmeter then the error can be de-

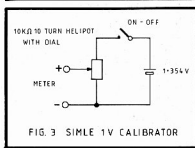
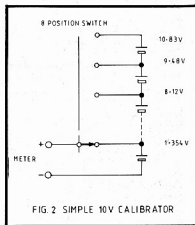


termined—it is the difference between the applied value and the indicated value. If the errors are small they may be neglected but larger errors may be removed by adjustment or by applying a correction. The correction is the error but with the sign reversed so that when the correction is added to the reading the result is a more accurate measurement. The difficult part is in obtaining a reliable reference voltage.

In *Ham Radio*, July 1978, Bob Stein W6NBI describes a simple meter calibration system. What is presented here is a simpler system based on some of the information in Bob's article. The calibrators described here are for DC voltages from 0.1 to 10 volts only. If you have just built a voltmeter or want to check an old one this may help you.

Bob maintains that all new 1.35V mercury cells of the types given in Table 1 have a terminal voltage of  $1.354V \pm 0.002V$  (better than  $\pm 0.15$  per cent) when loaded to about 0.1 mA.

So for a calibrator covering 1 to 10V DC eight batteries may be wired as shown in Fig. 2. Higher voltages require a very large drain on the pocket or a more complicated circuit—most novices may find calibration up to 10 or 20V adequate. For voltages less than 1V a calibrated divider can be used as shown in Fig. 3.



A word of caution. The current drawn by the test meter may cause errors. For example with the divider of Fig. 3 set at 5.0, on 20,000 ohm-per-volt meter on the 1V range has a resistance of 20 k-ohm. The current through the divider is 135  $\mu$ A and the meter wants 25  $\mu$ A. This upsets the unloaded ratio and results in the meter reading 20 per cent lower than it should. The error will decrease as the divider is moved away from the midway setting. A meter with a 10 M-ohm input resistance would cause a loading error of only 0.05 per cent. These errors are caused by the effective output resistance of the calibrator not being zero. Fig. 4 shows the battery voltage  $V_b$  applied across the two resistors  $R_o$  and  $R_m$ .  $V_m$  is the voltage seen by the voltmeter which has an input resistance  $R_m$ .  $R_o$  is the output resistance of the calibrator and is calculated by dividing the open circuit voltage by the short circuit current. When  $R_o$  is very small and  $R_m$  is very large the size of  $V_m$  is almost the same as  $V_b$ , so the error is then small. For our circuit  $R_o$  varies from 0 to 5000 ohms, the minimum value occurs at the ends and the maximum at the mid setting.

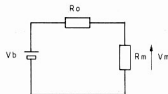


FIG. 4 EQUIVALENT CIRCUIT  
REFER TO TEXT

Note that when measuring any voltage there are loading errors. One time where these will be found is when measuring the voltage at the base of a transistor. The circuit resistances may be some hundreds of thousands of ohms so even a 10 M-ohm meter will usually give a noticeable error.

For our calibrator the problem could be reduced by reducing the value of the divider but this might cause the cell's terminal voltage to drop too much. As the accuracy of the second calibrator depends on the accuracy of the helpot and dial combination choose one of sufficient accuracy (e.g. 0.1 per cent) but check the price first.

#### CHARGING NICKEL-CADMIUM BATTERIES

Nickel-Cadmium (Ni-Cd or Nicad) batteries are in common use in today's amateur equipments. These are usually of the sintered construction type so the following discussion applies specifically to this type.

A battery consists of two or more cells connected in series or in parallel. The series connection is far more common so we will restrict ourselves to this type of battery. Commonly the cells are of the AA size.

The cells are able to force electrons through an external circuit because of a chemical reaction that takes place inside. By forcing a current in the reverse direction these chemical changes may be reversed; this is called charging. Not all batteries can be recharged as sometimes the chemical changes are not reversible. Non-chargeable batteries are called primary batteries, chargeable batteries are called secondary batteries.

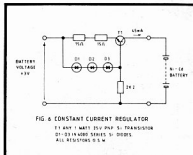
#### CAPACITY

The normal terminal voltage of a Ni-Cd cell is 1.20V but this may rise to 1.35V when fully charged or even to 1.45V during charging. See Fig. 6. Thus a nominal 9.6V battery may rise to 11.6V on charge or possibly even a little more. For this reason it is unwise to operate some equipment during charging.

Apart from terminal voltage another distinguishing feature of a battery is its ability to supply current for an extended period of time. This is called capacity and has the units of ampere-hours or, for smaller batteries, mA-hrs. The capacity is the product of the load or discharge current times the time that the current flows until the battery is discharged or flat. A cell is considered discharged when its terminal voltage falls to 1.0V. The capacity is determined from the 5 hour rate. That is a cell with a 450 mA-hr. capacity will supply 90 mA for 5 hours. If the cell is discharged at a faster rate the capacity measured will be less.

#### CHARGING

Charge rates are usually determined by dividing the capacity by 10, thus our 450 mA-hr. cell should be charged at 45 mA. Because the recharging process is not 100 per cent efficient the charge must be continued for some 12 to 14 hours. Fig. 6 shows a constant current circuit for charging Ni-Cds.



The constant current circuit works as follows. Current flows through D1, D2, D3 and the 2.2 k-ohm resistor producing about 1.8V across the diodes. Because of the knee in the diode characteristic the voltage across the diodes is nearly constant. The base-emitter voltage,  $V_{be}$ , of T1 is close to 0.6 volts when it is conducting and it also remains fairly constant. Now examining the circuit we see that the voltage drop across the two 15 ohm resistors is the difference between the diodes' voltage and T1's  $V_{be}$ . As this is 1.2V the current through the resistors is  $30/1.2 = 0.04A$ . Further this voltage across the resistors does not vary so the current through the resistors and therefore the collector current of T1 will not vary. In practice the current will vary 5 per cent or so and may be between 40 and 45 mA. Also if the collector circuit is connected to a resistor greater than 240 ohms then less than 40 mA may flow unless the supply voltage is greater than 13V.

The advantage of a proper constant-current source is that the battery is charged at a known and constant rate and so the full charge may be given by timing the process. I suggest that Ni-Cd batteries always be allowed to be fully discharged

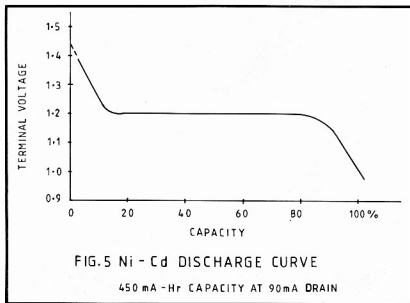


FIG. 5 Ni - Cd DISCHARGE CURVE

450 mA - Hr CAPACITY AT 90mA DRAIN



TET



MFJ-250

KW  
Dummy  
Load  
With Oil



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MFJ-949B



300 Watt Antenna  
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MFJ 941C Versa Tuner II

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## J.I.L.

SK 200 Programmable HF/VHF/UHF  
NEW scanning receiver, 26-180, 380-514MHz.  
Updated AM & FM. Includes Australian low  
version band and Air band.  
Scan-X Discone Antenna, 65-520MHz for  
VHF/UHF receivers. 45.00

## SKY ACE

R-517 Airband Receiver 108-140 MHz and  
3 Channels. 109.00  
R-CC Carrying case for R-517. 8.00  
X-SA Crystals - Standard for R-517. 8.00  
X-CA Crystals - Special to order for  
R-517. 20.00

## PS 30 AC Adapter for R-517.

10.00

## BROADBAND VHF/UHF ANTENNAS

Scan-X 65-520MHz Discone 3dB gain for  
receivers only. 45.00  
GDX-1 80-480MHz Discone for Tx and  
Rx use. 75.00

## Gingo

144-170MHz gain vertical, adjustable. 54.00

## A.S.E. HF ADJUSTABLE MOBILE WHIPS

G-80 80MHz Heavy duty helical 7ft long. 39.00  
G-40 G-10 40-10MHz H.D. Helicals 6ft long. 34.00  
Super G-80 150 80-150MHz Helical Whip 8ft. 59.50  
G-BM Bumper Mount for A.S.E. Helicals. 18.50

## H0XIN

HFS-DX 80-10MHz Trapped vertical, no guys. 149.00  
Self supporting with self supporting  
radials.

## GSS

Deluxe Gutter Mount, will take most 10.00

## F-1E

Rubber Duck Helical for 146-170MHz 10.00  
with PL-259 base.

## TOWERS

G20/1 6m Single section self supporting. 105.00  
G20/2 6m Double section self supporting. 115.00  
G20/6 6m Tubular 2" mast. 34.00  
G20/8 6m Heavy Duty Box Base for G-20/1/2. 199.00  
G10/8 3m Heavy Duty Box Base for G20/1/2. 179.00  
GM-154 5m Tubular 1 1/2" mast. 25.00

## CABLES

RG-58/AU Standard 5.6dB/100ft a 100MHz loss. 6.00m  
58-FB Low loss 2dB/100ft a 100MHz. 1.45m  
G-R7 High Quality 7 core Rotor cable. 1.30m  
8d FB Low loss FOAM-DOUBLE SHIELDED 2.00m  
1.6dB/100 a 100MHz.

## PUBLICATIONS

Kit of Maps Incl. World Map, US Map & Atlas. 6.00  
Great Radio Map Centred on Melbourne. 1.00  
US Callbook United States Call Listing. 20.00  
Foreign Callbook Call Listing of the World. 19.00

## MODEL DESCRIPTION R.RETAIL

### MFJ ANTENNA TUNERS

MFJ-984	3KW Ant. coupler/Dual meter type SWR/power meter/Co-Ax switch, for bal and un bal line (Inc. Balun).	449.00
MFJ-982	3KW Ant. coupler/SWR/power meter for bal and un bal line (Inc. Balun).	309.00
MFJ-982	1.5KW Ant. coupler/SWR/power meter 6 pos. Co-Ax SW for bal and un bal line (Inc. Balun).	255.00
MFJ-961	1.5KW Ant. coupler/6 pos. Co-Ax SW for bal and un bal line (Inc. Balun).	229.00
MFJ-949	300W Ant. coupler/SWR/Power meter Dummy load/Co-Ax SW for bal and un bal line (Inc. Balun).	
MFJ-941B	300W Ant. coupler/SWR/Power meter Co-Ax SW for bal and un bal line (Inc. Balun).	159.00
MFJ-943	300W Ant. coupler for bal and un bal line (Inc. Balun).	129.00
MFJ-901	200W Ant. coupler for bal and un bal line (Inc. Balun).	109.00
MFJ-900	200W Ant. coupler for un bal line (Inc. Balun).	99.00

### OTHER MFJ PRODUCTS

#### SSB/CW FILTERS

MFJ-752	Dual tunable active SSB/CW filter Inc. Peak/Notch, noise limiters and two variable freq. filters. Tunable active SSB/CW filter.	165.00
MFJ-751	751	129.00

#### KEYERS

MFJ-484	Grandmaster Keyer, 400 character memory plus many more features.	249.00
MFJ-408	Electronic Keyer with speed meter.	165.00
MFJ-481	Memory Keyer, stores 2 x 50 character messages 8-50WPM.	165.00
MFJ-402	Econo Keyer, built in paddle, weight and speed control 8-50 WPM solid state keying.	95.00

#### MISCELLANEOUS

MFJ-410	Morse Processor, morse code tutor stores unlimited random code in random groups.	
MFJ-1020	Active indoor antenna for rears.	139.00
MFJ-250	2KW Oil cooled Dummy load.	
MFJ-959	Ant. coupler with 20dB Rx Preamp.	149.00
LSP-520	Super Logarithmic speech processor x11 30dB dynamic range & 3 active filters.	99.00
MFJ-202	Antenna Noise Bridge, wide range 0-250 OHMS - 150pF X 1-100MHz.	99.00
MFJ-HK-1	Morse Code Manipulator.	59.00

### DENTRON PRODUCTS

DTR-2000L	2KW Linear Amplifier, uses 1 x 6B7 1570.00
MLA-2500B	2KW Linear Amplifier, uses 8875's 1470.00
Clipperton-1	2KW Linear Amplifier, uses 4 x 8875's 889.00
	572B's (new model)
CLA-1000B	1KW Linear Amplifier uses 4 x 6LQ6 470.00
Clipperton	1KW 2m's Linear Amplifier. 589.00
DTR-1200LF	1KW Linear Amplifier. 785.00
DTR-3KA	1KW Antenna Tuner. 470.00
RT-3000	1KW A-senna Tuner. 354.00
AT-3K	1KW Antenna Tuner. 299.00
AT-1K	1KW Antenna Tuner. 178.00
JR Monitor	300W Antenna Tuner. 89.00
Bq Dummy	2KW PEP Oil Cooled Load. 46.00
T-100	0-500MHz 100 Watt Load. 68.00
T-200	0-500MHz 200 Watt Load. 48.00

### MIRAGE AMPLIFIERS

S-1016	2M's Linear 160 Watts.	389.00
S-108	2M's Linear 80 Watts.	259.00

## MODEL DESCRIPTION R.RETAIL

### ANTENNAS SWISS QUAD SERIES BY T.E.T.

SQ-20M	20M's 104dB gain. (Elements loaded)	389.00
SQ-15	15M's 122dB gain. Swiss quad.	179.00
SQ-10	10M's 123dB gain. Swiss quad.	169.00
SQ-61	6M's 123dB gain. Swiss quad.	129.00
SQ-22	2M's x 2, 15dB gain. Swiss quad.	109.00
SQ-22D	2M's x 4, 17dB gain. Swiss quad.	199.00
SQ-24	2M's x 4, 18dB gain. Swiss quad.	229.00
SQ-407	70cm x 2, 15dB gain. Swiss quad.	109.00

### ATN ANTENNAS

28-30.3	10/11MX 3d1 Yagi 8dBd gain.	85.00
28-30.5	10/11MX 5d1 Yagi 9.5dBd gain.	145.00
28-30.6	10/11MX 6d1 Yagi 10dBd gain.	189.00
51-53.5	6MX 5d1 Yagi 9.5dBd gain.	90.00
51-53.8	6MX 6d1 Yagi 12dBd gain.	140.00
144-148.8	2MX 8d1 Yagi 12.5dBd gain.	50.00
144-148.11	2MX 11d1 Yagi 14.5dBd gain.	60.00
144-148.16	2MX 16d1 Yagi 14.8dBd gain.	80.00
420-470.6	0.7MX 6d1 Yagi 8dBd gain.	55.00
420-470.14	0.7MX 14d1 Yagi 13.7dBd gain.	80.00
432-161B	0.7MX 16d1 Yagi 14.8dBd gain.	45.00
47.7	CB 7d1 Yagi 11dBd gain.	45.00
47.11	CB 11d1 Yagi 17.2dB gain.	55.00
PK-12.27.29	2" wave vertical for 28MHz.	38.00
580-14	0.5MX ATU Yagi 15.3dBd gain.	60.00
20-30.1	Adjustable Dipole.	36.00
20-30.1HV	Adjustable Dipole. Horizontal or Vertical Mount.	42.00

### ATN BALUNS

3-150-1-1 200	200 Watt 3-150MHz 1:1.	12.00
100-600-1-1 200	200 Watt 100-600MHz 1:1.	15.00
3-150-4-1 200	200 Watt 3-150MHz 4:1.	15.00
3-100-1-1 1KW	1KW 3-100MHz 1:1.	22.00
3-100-4-1 1KW	1KW 3-100MHz 4:1.	25.00

### ATN POWER DIVIDERS

140-150-2	Couples 2 x 50 OHM 140-150MHz.	45.00
140-150-4	Couples 4 x 50 OHM 140-150MHz.	55.00
400-470-2	Couples 2 x 50 OHM 400-470MHz.	43.00
400-470-4	Couples 4 x 50 OHM 400-470MHz.	53.00

### INSULATORS FOR THE HOME CONSTRUCTOR

Type 1 H.D. for 1/2" or 5/8" el to 2" boom.	4.00
Type 2 H.D. 3/8" el to 1" boom for D.E.'s.	1.25
Type 3 H.D. 3/8" el to 1" boom for Para Is.	1.00
Type 4 H.D. 7/8" el to 2" boom.	4.00

### TRAPPED DIPOLE ANTENNA

A-248D 60 ft long, 80/40/20MX Dipole. 69.00

### ANTENNA ACCESSORIES

Yagi Insulators	See above for types.	
SWR-25	Dual meter SWR/Power 3.5-150MHz.	36.00
FS-500H	PEP Reading SWR/Power meter.	125.00
MFJ-202	Antenna Noise Bridge. See MFJ.	
TV-42	Low pass filter.	29.00
BL-1A	UM HF Dipole balun.	18.00

### EMOTATOR

103SAX	Medium Duty Rotorator, 240V.	185.00
502SAX	Heavy Duty Rotorator, 240V.	269.00
1102MX	Extra Heavy Duty, 240V.	389.00
1211	Mast Clamp for 103SAX.	22.00
1213	Mast Clamp for 502CXX.	35.00
1315	Mast Clamp for 1102CXX.	55.00
303	Mast Bearing.	35.00
301	Mast Bearing Double Section.	49.00

before recharging — a reduction in capacity results from continual part recharges.

Many of you might want to charge a nominal 12V battery from a 12V nominal supply. It cannot be done with the constant current circuit as this would require about 17.5V input. Direct connection to a power supply or battery could result in the cells exploding and would certainly reduce their capacity. The fast charging that would occur would produce much heat and a considerable quantity of oxygen. If the cell vents you lose valuable chemicals and if it doesn't you may lose your hand! The internal pressures can be very high indeed! Special circuits are required for safe rapid charging of Ni-Cds.

The circuit in Fig. 7 shows an adaptor to allow 12V batteries to be charged at a constant current from a 12V source. A 555 IC timer is connected as an astable oscillator operating in the kHz region. The square-wave output from pin 3 feeds a voltage-doubling circuit using C4, D1, D2, C5. High frequency spikes are filtered by the 4.7 ohm resistor and a 0.01 uF capacitor. The output of this circuit is connected to the constant current circuit. A similar circuit was described by P. N. Butterfield in *Rad. Com.*, May 1973, and gave very good results for input voltages between 11 and 15 volts.

#### CARE

Ni-Cds can be stored in any state of charge unlike most other secondary (rechargeable) cells, however they should not be discharged below about 0.8V per cell otherwise there is a possibility of reverse charging one or more cells in a battery. Reverse charging will reduce cell life. Overcharging will also reduce cell life, although a continuous "topping-up" charge of say 5 mA will do no harm.

If a cell appears to have lost capacity, or has been discharged for some time, two

MALLORY	EVEREADY
RM 12R	E 12N
RM 4C1R	E 401N
RM 502R	E 502
RM 501R	E 601

TABLE 1 SUITABLE CELLS

cycles of full charge, followed by full discharge, should restore the cells to a healthy state.

Some small crystals may form near the positive terminal. These are of no great significance but should be wiped off with a clean dry cloth and a smear of silicon grease wiped on to inhibit further growth.

Ni-Cds will slowly discharge if left alone, losing 80 per cent of their capacity at normal room temperature over five months. Higher temperatures speed up the process.

Do not short Ni-Cds as even small ones can deliver 10A or so and may heat the short to incandescence (OUCH!) and/or, because of internal gassing, may explode.

At the end of their life the cells are prone to developing internal shorts. WITH CARE these shorts can be temporarily removed using a power supply limited to 2A. The negative of the supply is connected to the negative of the cell with a heavy lead and another similar lead connected to the positive terminal. The power supply voltage is set to, say, 5V and the positive wire touched to the cell's positive terminal briefly (less than 1 second — otherwise ...) three times. The short will probably be removed and the cell should accept and hold charge. I wear safety glasses when carrying out this procedure but extra precautions could be taken.

Look after your Ni-Cds and they will look after you.

73 de VK3AFW.

## Victorian Division WIA Western Zone Convention 1981

VICTORIAN DIVISION WIA  
WESTERN ZONE CONVENTION — 1981

Location: Hamilton, Wool capital of the world.

Host Club: Hamilton and District Radio Club.

Date: Weekend Saturday, 31st October, Sunday, 1st November.

Venue: Hamilton Showgrounds.

All accommodation will be the responsibility of those attending.

Caravans: A limited number of private caravans will be available for families.

#### PROGRAMME

**Saturday Afternoon:** Registrations, trade displays, natter time (eyeball QSO), coffee and tea available (free), official dinner (7 p.m., BYO drinks), entertainment.

**Sunday Morning:** Limited number of challenging competitions, scenic bus tour, competitions for XYLs and harmonics, trade displays (all leading suppliers of amateur/CB/marine equipment represented).

Talk-in operating both days.

For further details contact the Secretary, Box 188, Hamilton. Phone (055) 72 3609. ■

## LINGUISTS . . . Please Help

AR receives regular copies of overseas foreign language Society magazines on a reciprocal basis, such as —

VERON  
CQDL  
QTC  
RADIO (USSR)  
OZ  
OLD MAN  
JARL NEWS  
RADIO AMATEUR

Copies of these occasionally contain articles and news which may be of interest to AR readers, but without proper translations cannot be used.

If any member is technically qualified as a particular language translator, could he please let us know so that his name may be recorded for any translation which might be needed in his language.

## EDUCATION NOTES

From Brenda Emonds VK3KT

Trial Novice Examination papers will be available for distribution late in October.

Details will be in October AR.

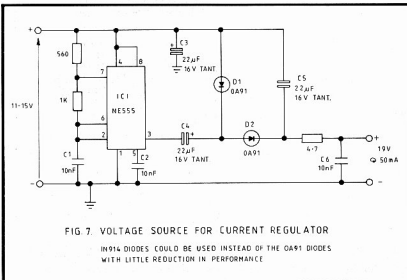


FIG 7. VOLTAGE SOURCE FOR CURRENT REGULATOR

IN914 DIODES COULD BE USED INSTEAD OF THE 0A91 DIODES  
WITH LITTLE REDUCTION IN PERFORMANCE

# AWARDS COLUMN

Bill Verrall VK5WV  
7 Lilac Avenue, Flinders Park, SA 5025

Here is a list of WIA Awards issued during the period 1st January, 1981, to 30th June, 1981, and the top DXCC tallies, new members and amendments as at 30th June, 1981.

## WAWCA AWARD

Cert.	Call Sign	Cert.	Call Sign
922	WA6DTG	939	Y53YF
923	GM4FIW	940	JH6WOC
924	VE3BZ	941	JA6XZS
925	VS6CT	942	JA2BXV
926	UK3AAC	943	KA5ASD
927	UB5CDF	944	VP2VBK
928	UA0CCW	945	I2JQ
929	UK6LEZ	946	JH1KYY
930	UQ2HO	947	JA7DLE
931	UA1MU	948	JA8IXM
932	S6ST	949	W1BPM
933	JA1AUC	950	OK3PFF
934	W8LKG	951	DJ3ND
935	JH1XUP	952	SM6CST
936	K7VV	953	WB4FNH
937	K8T5B	954	WB3CQN
938	G3BII		

## WAS (VHF) AWARD

Cert.	Call Sign
136	VK2QF
137	VK2BON plus 3 additional countries
138	VK2BJC
139	JA6TEW
140	VK1ZAR plus 5 additional countries
141	VK2LM
142	VK3AUI plus 12 additional countries
143	VK3NM plus 10 additional countries
112	VK2ZGF (Amendment) plus 7 additional countries
128	VK3AWY (Amendment) plus 11 additional countries

## HAVKCA (SWL) AWARD

53 UL7-023-107 Alex Chernykh

## VHFCC AWARD

105	VK4SN (52 MHz)
106	VK4ZSH (144 MHz)
107	VK3AUI (52 MHz)

## DXCC — TOP LISTINGS (All at 275 and over)

Call Sign	Tally	Call Sign	Tally
VK —		VK —	
BRU	317/263	4RF	300/310
SMS	317/359	6HD	298/305
4KS	316/348	4PX	397/312
5AB	315/345	3AHO	294/326
6MK	313/350	3AKK	294/296
3JF	308/320	2APK	293/313
6LY	307/321	4UC	293/306
4FJ	306/343	3OT	291/292
7LZ	306/323	5XN	289/302

4VC	305/316	4AK	289/298
7DK	304/319	7AE	289/291
3AMK	303/312	3RF	278/280
5WV	300/312		

## OPEN

Call Sign	Tally	Call Sign	Tally
VK —		VK —	
6RU	317/362	2APK	301/329
4SD	317/348	2SG	296/314
4KS	316/352	4UC	296/310
3YL	316/348	3AKK	295/297
6MK	313/350	3AHO	294/236
4FJ	312/356	3OT	294/295
3JF	312/332	3XB	292/320
6HD	309/322	4AK	289/299
4RF	308/332	7BC	289/293
7LZ	307/339	5RX	282/313
7DK	305/320	2AHH	279/305
4PX	304/323	4DP	278/287
3AMK	303/312		

## DXCC — NEW MEMBERS PHONE

Cert No.	Call Sign	Tally
252	VK2BQS	100
253	VK4NLL	107
254	VK6UN	117
255	VK2PY	154
256	VK2VFT	138/139
257	VK2BDT	99/102
258	VK4NMW	101/102
259	VK5ABW	170/171
260	VK3VMW	130
261	VK3VFE	109
262	VK6HD	298/305
263	VK6OE	103
264	VK3AVY	121
265	VK3VDI	105
266	VK0PK	100/101
267	VK3ZB	103/118
268	VK2NUC	115
269	VK5BO	103

## CW

Cert No.	Call Sign	Tally
113	VK3AKK	109
114	VK6HD	246/252
115	VK3BBT	100
116	VK1DH	113

## OPEN

Cert No.	Call Sign	Tally
200	VK8BE	101/102
201	VK1DL	113/114
202	VK5MV	122/123
203	VK1DH	133

## DXCC — AMENDMENTS PHONE

Call Sign	Tally	Call Sign	Tally
VK —		VK —	
2SG	260/274	3NSR	194/195

2AFF	119	3VGD	185/186
2DPN	134	4BG	260/270
2NHV	133/134	5LC	251/261
2NQL	175/176	5OU	259/260
2VAB	203/204	5NVW	136
3DS	161/167	6IR	250/251
3VU	201	6AJW	208
3AHH	150/153	6NAT	178/179
3ALM	238/244	6NEP	184/185
3AWY	256/257	7BC	272/275
3NDY	249/250	3DFD	222/223

## CW

Call Sign	Tally	Call Sign	Tally
VK —		VK —	
2SB	138/148	5BO	160/182
3JF	217/231	6HD	246/252
3KS	252/271	6RU	261/300
3RJ	255/281	7BC	137/138
4PX	104/112	7LZ	253/283

## OPEN

Call Sign	Tally	Call Sign	Tally
VK —		VK —	
2AAC	158/161	5BO	212/244
3NDY	250/251	5ARA	129
4BG	269/282	6NAT	179/180

## RTTY

Call Sign	Tally
VK —	
2SG	110/111

Good hunting.

## FAMOUS AMATEUR MICROPHONE NOW AVAILABLE IN DUAL IMPEDANCE

## SHURE MODEL 444-D



- Microphone Features:
- High-output, durable, totally reliable CONTROLLED MAGNETIC cartridge.
- Response tailored for speech intelligibility.
- Switch selectable high or low impedance.
- Normal/VOX switch on microphone.
- Double-pole, double-throw, Million-Cycle least-type push-to-talk switch with momentary or locking switch bar.
- Three-conductor, one-conductor shielded coiled cable.
- Cable and switch arranged for instant connection to grounded or isolated transmitter keying.
- Rubber feet keep microphone from slipping.
- Height adjustment for operator comfort.
- Strong AFMO-DUR case impervious to rust and corrosion.

PRICE: \$106.45

WILLIAM WILLIS & Co. Pty. Ltd.

PHONE: (03) 836 0707

98 CANTERBURY ROAD, CANTERBURY, VIC., 3218

## SPOTLIGHT ON SWLing

Robin Harwood VK7RH

5 Helen St., Launceston, Tasmania 7250



One of the easiest South American states received here in Eastern Australia is Radio HCJB in Quito, Ecuador, whose signals have been consistently readable in the South Pacific for many years. Currently celebrating its 50th anniversary, it has been providing programmes to listeners in South America and beyond. It commenced operations on Christmas Day 1931 with a 250 watt transmitter from a site in Quito, the nation's capital. Operated by the World Radio Missionary Fellowship Inc., it is probably the world's first radio missionary station.

It is sited in a very good position, being located right on the Equator, as well as being high up in the Andes Mountains. Since its early days, HCJB has developed a close relationship with the Quechua people, descendants of the Inca nation. Today it broadcasts in several dialects of Quechua as well as in Spanish, which is the predominant tongue throughout most of the continent with the exception of Brazil. In the early days, when radio receivers were very uncommon in Ecuador, the station manufactured its own receivers tuned to its frequencies, which in turn were distributed to communities and villages free. However, with the advent of the mass produced transistor receivers in the sixties, there was no further need to manufacture these receivers.

Radio HCJB expanded their operations in the forties to include programming to other areas of the globe. Because of Quito's relative remoteness from transport and communications with technical and industrial facilities in America, the engineering staff have had to improvise, and construct their own transmission systems, antennas, and even their own hydro-electric plant to power their facilities.

Did you know that the Cubical Quad, which many Hams have constructed and used on the higher bands, was developed by one of the HCJB staff? Clarence C. Moore was working on the problem of corona discharges from the antenna, because Quito's elevation is over 3,000 metres, and the atmosphere is rarefied. Out of this dilemma was born the Cubical Quad.

The majority of the shortwave and MW transmitters were built by HCJB's own engineers, only three being commercially manufactured. In February of this year, they installed a 500 kW transmitter, which was built to their own design in America by HCJB staff together with Crown Laboratories. It is a unique design, having one huge valve instead of many smaller tubes to provide comparable power. Since its inauguration, signals have been excellent from it, and when the steerable array is completed, it will add between 19 and 25 dBm, and should reach most areas of the globe.

Because of the inadequacy of their present power plant to service their 500 kW facility, there are plans to increase its size with the installation of a 600 kW generator and other ancillary equipment for an additional plant.

One of the most popular programmes from HCJB is the "DX Partyline". Until July of this year it was hosted by Clayton Howard, assisted by his wife, Helen. This is perhaps the most regular DX programme, with three separate editions each week. It is on the air to the South Pacific at 0900 GMT on Mondays, Thursdays and Saturdays on 6130 kHz. The other two scheduled channels to this region at this time carry other programming. Roger Stube, who did visit Australia last year, is the current host. Many of HCJB's worldwide listeners are members of the Andes DX International (AndeX), the "Partyline's" DX Club with over 4,000 members.

During the sunspot maxima of 1979-80, HCJB engineers were experimenting with a 100 watt converted Johnson-Viking Ham transmitter as a propagation exercise on 26020 kHz. Many heard these transmissions which commenced with a simple half-wave wire dipole. Later an 11 metre quad was tried and signals were quite good at times. However, when the 500 kW transmitter was installed, the quad had to be re-sited, and an 11 metre half-wave vertical has been employed since then. Nowadays, these signals are rarely observed because of the change in propagation patterns on these frequencies.

Other Latin American signals have been heard recently in south-eastern Australia. The 60 and 90 metre tropical bands have had several good catches from 0930 to 1015 GMT. Radio Sutatenza on 5095 is very consistent, although it is using 50 kilowatts! Radio Reloj Continente in Caracas, Venezuela, on 5030 is quite audible at times as well. Some lower powered stations can be readily observed on the 49 metre band in our late afternoons and early evening hours. I mostly hear stations from the west coast of South America, as Tasmania seems to be a dead spot for signals from Brazil and other east coastal regions.

Well, that is all for this month. Until next time, 73 and good DXing! ■

## Hamming in Brazil

The Marissa Amateur Radio Club has a new member from Brazil, Gerardo A. Vale PT7WVF. He is an exchange student at the Coulterville IL High School and speaks Portuguese and Spanish as well as English. His father is president director of an industrial company that makes 200 different products in South America.

Gerardo's first interest is in being a doctor or surgeon, second interest is in business administration, and he also enjoys the field of electrical engineering. When he returns to Brazil in March he will take entrance exams for one State and one Federal University.

In Brazil there are class "A", "B" and "C" licences. You can begin in class "C" from 14 to 18 years of age and operate CW on 40, 20, 80 and 160 metres. In class "B" you can operate 2, 40, 80 and 160 metres in the phone portion. Class "A" can operate in all bands — 2, 10, 15, 20, 40, 80 and 160 in CW and phone. You can obtain the class "A" licence only after one year in class "B".

Their 2 metre repeaters have 600 kc splits with PLL for those with autopatch. A group of 10 or 20 amateurs buy the repeater and these are the only users. Radio clubs also have 2 metre repeaters but without autopatch, because then anyone can dial it up.

Gerardo talks across his entire State via his HT. They use only FM on 2 metres, no sideband.

In Fortaleza (city) there are two clubs, Labre PT7AAC with a membership of 2,000 and Casa do Radio Amador do Ceara, PT7CRC, membership of 1,500 (Amateur Radio Club of Ceara). Ceara is the State. You can have an associated membership in both clubs or just one, but you need to be a full member from one club.

Brazil has CW and phone contests. During the Pope's visit in Fortaleza, Gerardo and his dad PT7GAV helped the police on HF and VHF with security for the Pope via radio for three days. Then they had a contest during his visit to Brazil.

Every Saturday they have a meeting on the beach in a restaurant, eating and talking about radios, new contacts, etc. Once a month the clubs have a dinner and meeting.

Amateurs there help a lot of friends, too. When new amateurs have no radio or antenna yet, they loan equipment to them until they get situated. Clubs have their own radio stations and box numbers for Hams to write to the clubs.

Their department for amateur radio licences is DENTEL, the Departamento Nacional do Telecommunicacão (National Department of Telecommunications).

By Tania Miller WB9TFC, from ARNS Bulletin, June 1981. ■

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# Amateur Radio Station VK6ACH

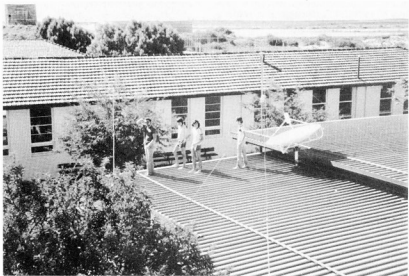
## Carnarvon Senior High School, WA

Peter F. Scharf,  
VK6APS

In July 1980, the school received a grant of \$714.00 from the Schools' Commission. The money was used to purchase a high quality communications radio and an interface unit which coupled the radio to the school's computer. This enabled us to receive morse and teletype transmissions which were electronically decoded and displayed in plain language. Of special interest are the weather reports which can be received daily.

However, the project snowballed and by successfully winning a tender from the Harold E. Holt communications base at Exmouth, plans were made to establish an amateur radio station at the school. The entire project has been assisted throughout by the people of Carnarvon. The mast was donated by Wolf Frost VK6WF, and the base was constructed with the assistance of Mr. Reddyhough's metalwork class and Mr. Sheffield's alternative class. When the Public Works needed plans of the mast, Roger Veen assisted by drafting suitable sketches.

The metalwork was cold zinc dipped by Ray Smith at ARCKO engineering and the mast was raised with the assistance of students and staff. Guy ropes were installed by linesmen from Radio Australia/Telecom, including Seve VK6YK, Ross Kearney and Dave Boab. The transmitters were inoperative when first purchased and with the assistance of Colin Coles VK6ZCC at OTC, the units became operational. Wolf Frost once again assisted with oddment parts. Perhaps the whole project would have



Peter VK6APS with Ron, Shaun and Lawrence helping with dipoles. The 2 metre parabolic reflector is part of another project in which students are attempting to obtain photos from a weather satellite.

come to a halt if not for Gary Westcott who obtained the appropriate service manuals from the United States.

Year 11 students assisted on a Saturday morning to help put up the aerials and prepare them for the first test transmissions.

On Monday, June 29th, the station went on air with test contacts to Bunbury, a yacht in Fremantle harbour and a teacher on holiday in Queensland. In the afternoon Year 7 students from Central Primary and Year 10s from the high school spoke to students from Stella Maris at Geraldton and primary students at Northampton District High School.

On Friday, July 3rd, the station was officially opened by the Premier of West Australia, Sir Charles Court, with the call sign VK6ACH. During his address, Sir Charles stated that he hoped this exercise would bring about greater understanding between Australians and other nations and, in so doing, fulfill the broad educational objectives of this exercise. ■



As with all things electronic, there is room for Murphy's Law! Here is Steve VK6YK with assistance from Ross re-arranging the concrete mounting block because it had been put in the wrong way round.



Mast with guy ropes about half way up.

In the last column I listed the major headings of a WICEN handbook now in preparation and said that it would appear in parts in this column. This issue is devoted to the aim and duties topics. Please note that my duties are set by the Federal Executive, and I can only recommend the scope of duties for WICEN Co-ordinators within the States. I am indebted to Ken Ayres VK4KD for his memoranda which provided a basis for this month's column.

## AIM

The aim of WICEN Amateur Radio Emergency Communications is to form a pool of trained licensed operators, with equipment, available for deployment to aid communications in an emergency.

## FEDERAL WICEN CO-ORDINATOR

1. The Federal WICEN Co-ordinator is appointed by the WIA Federal Convention on the recommendation of the Federal Executive. He is an ex officio member of the Executive.

2. In practical terms, the principal duties of the Federal WICEN Co-ordinator are:—

- (a) To act as the focal point of contact and co-ordination between the Amateur Service and the Natural Disasters Organisation with a view to ensuring that the Amateur Service is fully prepared and readily available to assist in times of national emergency.
- (b) To co-ordinate any amateur communication facilities required on a national scale for disaster purposes.
- (c) To co-ordinate and liaise with State WICEN organisations, and without thereby interfering with their internal affairs, to assist them in matters of common concern (such as frequencies, signalling procedures, training syllabi, and the like).
- (d) As far as practicable, to maintain a record of the manpower and facilities likely to be available within, and from, each State for emergency purposes.

3. The Federal Co-ordinator is supported by a Federal WICEN Committee provided by the ACT Division.

## STATE WICEN CO-ORDINATORS

4. State WICEN Co-ordinators are appointed by WIA Divisional Councils in accordance with local by-laws or rules.

5. Their duties should embrace the following matters:—

- (a) To promote an awareness of WICEN within their Division amongst amateur radio operators, clubs and authorities.
- (b) To liaise with the State disaster control authorities, normally SES, police, bush-fire councils, at State management level and keep them aware of WICEN's capabilities.

(c) To maintain records of amateur radio operators who have declared their willingness to join and support WICEN.

(d) To conduct training classes, exercises and information networks/newsletters for WICEN members.

(e) To establish communications networks for disaster control authorities upon request, and notify Department of Communications of such activations.

(f) To maintain liaison with the Federal WICEN Co-ordinator and report regularly to their WIA Divisional Councils.

6. State WICEN Co-ordinators will normally be assisted in their duties by a State WICEN committee and by Regional and local Co-ordinators on a structure generally mirroring the State disaster authorities structure.

## REGIONAL WICEN CO-ORDINATORS

7. Regional WICEN Co-ordinators (and deputies) will be appointed as necessary under State arrangements to bridge the geographical gap between State Co-ordinators and local Co-ordinators who are often associated with radio clubs.

8. Their duties could include the following:—

(a) To promote an awareness of WICEN within their region amongst amateur radio operators, clubs and the authorities.

(b) To liaise with the local WICEN Co-ordinators within the Region (as defined on regional map) and to ensure that each is active and constructive in his approach to emergency situations.

(c) To establish a good liaison with the Regional Operations Officer of the State Emergency Service. To ensure that each local WICEN Co-ordinator in the region has a good liaison with the local SES Controller and local Police Inspector responsible for Counter Disaster Organisation.

(d) To maintain records of local WICEN Co-ordinators and operators in the region with names, addresses, call signs, telephone numbers and any other relevant information.

(e) To ensure that all WICEN operators are trained and exercised in emergency procedures under the guidance of their local WICEN Co-ordinator.

(f) To keep authorities informed of the existence and capabilities of the local WICEN groups.

(g) To monitor WICEN frequencies in an emergency and to assist if it should be necessary.

(h) The Regional Co-ordinator should be familiar with the regulations in the Handbook, particularly those affecting emergency operations.

(i) To ensure that their State Co-ordinator for WICEN is kept informed of any changes in the Regional organisation and networks.

## LOCAL WICEN CO-ORDINATORS

9. Local WICEN Co-ordinators (and deputies) provide the link between WICEN, local radio clubs or groups of amateurs and local SES or other disaster control agencies. They will be appointed under State WIA arrangements.

10. Their duties could include the following:—

(a) To promote an awareness of WICEN within their area amongst the amateur radio operators and the authorities.

(b) To maintain a communication link into the WICEN network in the event of an emergency.

(c) To organise, if justified, a local emergency network to meet the requirements of the area. To organise regular practice exercises using correct WICEN procedures as laid down and generally supervise the running of such a network.

(d) To act as the liaison officer with the State Emergency Services in your area or other authorities as necessary.

(e) To maintain a close liaison with your WICEN Regional Co-ordinator and to act on such policies or suggestions that may be issued from time to time.

(f) To maintain a list of WICEN operators in the area with addresses, call signs and telephone numbers. Such information is to be lodged with the Regional Co-ordinator together with a plan for the local network and frequencies used locally.

(g) The local WICEN Co-ordinator should be familiar with the regulations in the Handbook, particularly those affecting emergency operations.

11. The aim is to establish a chain of responsible amateurs, with alternatives, to extend from State down to local level. ■

## MAGAZINE REVIEW

Roy Hartkopf VK3AOH

(G) General. (C) Constructional. (P) Practical without detailed constructional information. (T) Theoretical. (N) Of particular interest to the novice.

### BREAK IN April 1981

Elliptic Bandpass AF Filter (T). EME Considerations (G).

### QST April 1981

Coaxial Cable (GT). Ohm Meter for Low Resistances (P). RF Attenuator (P).

### ORBIT April 1981

General Amateur Satellite Information.

### BREAK IN May 1981

Unusual Varicap Oscillator (G).

### 73 MAGAZINE July 1981

Non-standard Offsets for the IC-2A (C). Grandma Packs a Seabag (G). Amateur Telemetry (P).

### August 1981

The DX Primer (GN). ■

# National EMC Advisory Service

Tony Tregale VK3QQ  
Federal EMC Co-ordinator

## ISLAND DX

"Buy yourself an isolated Pacific Island" or "Clean up your own patch" — the world of electronic gadgets is closing in!

Your best protection against complaints of FRI is to ensure that your own home electronics and domestic entertainment equipment is free of all interference.

Not many of us have the privilege or the necessary cash to isolate ourselves with real estate. In the interests of the continued wellbeing of the Amateur Service, we should all make ourselves aware of the new electronics devices which are being poured on to the domestic market.

Every effort is being made to get domestic equipment manufacturers and agents to co-operate by providing assistance with electro-magnetic problems associated with their equipment. The production of an "Australian Directory of Assistance" is progressing, but speed is not on our side. On the flip-side of the coin, interference to amateur reception also gets its share of attention by the EMC team. Those of us who have been keeping up with the elec-

tronic press won't have failed to notice how close we are to teletext, pay TV and cable TV.

Reports from the USA and Canada indicate that cable TV systems are expanding rapidly in major urban areas, and are posing a potential threat to amateur radio operations. Since cable systems are supposed to be closed (non-radiating), many utilise the VHF spectrum from 50 to above 225 MHz for their multi-channel content, providing subscribers with continuous tuning converters to permit them to tune in cable channels outside the standard 12 channel VHF TV band. This procedure puts some cable-carried signals into the amateur (as well as aircraft and public safety) bands, and when the system leaks (an all too common occurrence, due to corrosion, loose connectors or cable damage) interference results.

Cable TV is very susceptible to external electro-magnetic energy. Subscribers who have paid to watch cable material being transmitted within an amateur band aren't

likely to be very sympathetic when poorly shielded converters pick up amateur signals.

The effect of poor immunity and susceptibility of the average TV receiver, as seen by the DOC Canada, is outlined in a department summary: The DOC inspection workload has increased considerably over the last few years, due in the main to complaints from TV set owners that their reception was being disrupted by emissions from radio transmitters in the vicinity. Investigations have shown that most of these complaints were due to the inadequacy of most TV receivers to reject out-of-band radiation.

The National EMC Advisory Service has received very few reports or complaints regarding interference from home computers. We would be very interested to hear from anyone who has experienced this problem.

If you have any interference problems or answers, please don't sit on them, forward the details and help us to help you.

## ALARA

AUSTRALIAN LADIES' AMATEUR RADIO  
ASSOCIATION

ALARA celebrated its sixth birthday with an air sked on Monday, 27th July, with 16 YLs joining the frequency. VK2, VK3, VK5, VK6, VK7 and ZL represented. All wished ALARA continued success and also thanked the small band of "girls" who have kept ALARA alive and active.

The roster for Monday evenings is working well and has meant less work for Geraldine VK2NQI, who was net controller for two years. Also the editor of ALARA Newsletter. Thanks, Geraldine, for your support and contribution.

ALARA sked on Monday nights, 1030Z 3.570  $\pm$  MHz. Plans to have an ON AIR meeting on the 4th Monday of each month are being arranged and may be in progress when you read this article.

Congratulations to our "pin-up" girl Jenny VK5ANW (June cover of AR). On July 29th a number of YLs were on OPEN HOUSE, using the special AX prefix 2, 3, 5, 6, 8, 9, 0 participated and a lot of fun was had by all.

An up-to-date list of ALARA members is being compiled and will be published in AR to help OMs and non-member YLs in applying for awards and the contest to be held on November 14th. We are hoping for a good response for our first contest.

NEW ADDRESS for Geraldine VK2NQI is PO Box 39, Kemp's Creek 2171, NSW.

Our very grateful thanks to the committee of the VK5 Division of WIA for their very generous donation of their Gestetner duplicator machine. Marlene VK5QO wrote to the committee asking if the machine could be borrowed or purchased by ALARA. Marlene has accepted the position of Editor of our Newsletter, so thanks very much, Marlene, for taking this position and for your help in obtaining the duplicating machine.

So the new address for news for the Newsletter is Mrs. M. P. Austin VK5QO, PO Box 7A, Crafrers, SA 5152.

Our new President is Geraldine VK2NQI. Thanks a million, Geraldine, for taking this position, we wish you luck and offer our help and assistance in the future. ALARA's continuation seems assured with the additional help and interest shown by the girls who are coming forward and offering assistance, taking office or guiding in the background.

Each Thursday at 1000Z on 3.570  $\pm$  QRM a sked will be held for any YLs who cannot make the Monday skeds and also for committee members to discuss items for newsletter or publicity for magazine, contests.

Good luck to all who are sitting for exams in the near future and congratulations to those who have passed.

Until next month 73/33 to all.

Margaret VK3DML, 28 Lawrence Street, Castlemaine 3450.

The ALARA Contest, phone and CW, over 24 hours, will be held from 0000Z to 2359Z on 14th November on all bands. Details from ALARA.

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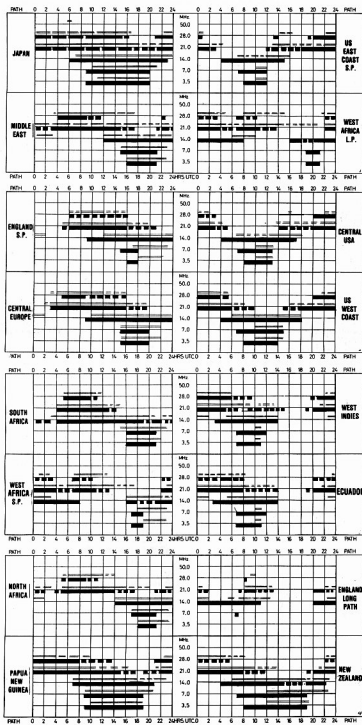
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ST. ALBANS, VICTORIA 3021

## PHOTOGRAPHS FOR AR

Don't keep them to yourself

**SEND THEM IN — NOW**

# IONOSPHERIC PREDICTIONS Len Poynter VK3BYE



LEGEND  
 FROM WESTERN AUSTRALIA  
 FROM EASTERN AUSTRALIA

BETTER THAN 50% OF THE MONTH, BUT  
 NOT EVERYDAY  
 LESS THAN 50% OF THE MONTH

Predictions courtesy Department of Science and Environment IPS Sydney.  
 All times universal UTC (GMT).

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## LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

261 Collier Road, Bayswater, Perth 6053

The Editor,  
Dear Sir,  
I found the article on RTTY in July 1981 AR of great interest — the mode intrigues me for sure.

However I was more than a little pteved by the appeal for operators (other than RTTY) to avoid QRMing and RTTY transmission.

On the face of it, a very reasonable request and I support the plea — up to a point.

As a regular operator transmitting slow CW under the call sign of VK6WIA on 3.555 MHz±, I have twice recently been obliged to QSY (with the group) due to RTTY operation — VK5AWI has had to do likewise — not good at all.

Whether RTTY operators consider novice phone bands I do not know, but I write to appeal to RTTY buffs to use perhaps CW band segments only and in so doing will further their cause of promoting RTTY.

As it stands now, I can only regard some RTTY operators with loathing (and I am not alone in this) and I must at a future date consider the possibility of a leisurely tune-up on a RTTY transmission — evil idea for sure, but what is sauce for the goose is sauce for the gander!

I would like to point out that with one exception (perhaps a VK2), phone operators will QSY upon request to allow VK6WIA programmes to proceed, but the same courtesy has not been forthcoming from RTTY operators for the simple reason that phone requests are unheard.

OK on RTTY Idents but rarely do I hear them within the 10 minute interval (and I can read CW at 18 w.p.m.).

So I ask RTTY and other stations that WIA transmissions (CW) be given a wide berth. If that can be achieved, RTTY will not antagonise anyone and CW enthusiasts will not develop an anti-RTTY frame of mind.

Bert VK6NPM.

5 Quinn Street, Penguin, Tasmania 7316  
7/7/81

The Editor,  
Dear Sir,  
In reference to the letter by VK4GY in July Amateur Radio, I would like to make several comments. Had it been printed before the recent widespread telephone service disruption there may have been some truth in some statements.

However time has proven the views expressed to be quite erroneous.

At short notice many amateurs not necessarily associated with WICEN formed themselves into a large net handling messages of a health and welfare nature to all parts of Australia.

The general feeling I received from message recipients was one of extreme gratitude after hearing from loved ones isolated for many days due to the Telecom dispute.

Was this really doing WICEN a disservice? I think not.

As for VK4GY's statement "A one man band", I doubt that a WICEN net has ever been so inundated with offers of assistance as was the third party net during this crisis. As there is no assurance that it will not occur again I believe there is a definite place for such a network.

WICEN isn't under threat from the national third party network as VK4GY seems to believe. Both offer a valuable service to the community.

My congratulations go to Sam VK2BVS for his initiative and the various net controllers for their hard work under such pressure.

Think again VK4GY, and let's move with the times.

Yours faithfully,  
Winston Nickolls VK7EM

## THE PUBLIC EXPRESSES ITS THANKS TO AMATEURS

Hawkin Street, Artarmon

The Editor,  
Dear Sir,  
TRIBUTE TO SAM

There was a sudden death in my family during the Telecom strike.

My husband, who was away in Wagga at the time, was eventually contacted through the efforts of Sam Voron and his fellow ham radio operators in Willoughby.

To those involved in sending the messages and in receiving them and passing them on, I give my thanks for their charity and concern.

Local "North Shore Times", June 24th.

93 Viccliffe Avenue, Campsie 2194  
15/6/81

Radio Assistance,  
Town Hall Annex,  
Victoria Avenue,  
Chatswood, NSW 2067.

The Editor,  
Dear Sir,  
I don't know whether this address is correct — it seemed the best I could come up with from what I heard over Radio Station 2CH. Anyway, if this reaches you, it is just to say a great big "THANK YOU" to you and the rest of your helpers who have come to the rescue in helping out with important personal phone calls that cannot get through because of the Telecom situation.

In this day and age, where no one seems to care about anyone else, I really do think you are all making an absolutely wonderful gesture of concern and care . . . that is all I wanted to say, but I wanted to say it to YOU and the rest of your radio operators . . . FULL MARKS FOR A JOB WELL DONE AND GOD BLESS YOU ALL.

Thanks again — most sincerely, I could kiss the lot of you and THAT in my book is really saying something . . . you can all take a bow!

June Miller.

## CHATSWOOD EAST WARD PROGRESS ASSOCIATION

President: A. E. Shelley.  
Secretary: E. Beaumont, 543 Mowbray Road, Lane Cove 2066.

17th June, 1981

Amateur Radio Club,  
Chatswood.

The Editor,  
Dear Sir,

Dear Members,  
While members of this Association have not had the necessity to avail themselves of your services, we do appreciate your public-minded action in helping people disadvantaged by the "Telecom" dispute.

Yours sincerely,

E. Beaumont, Hon. Secretary.

## EMC (ELECTROMAGNETIC COMPATIBILITY)

If radio frequency interference is causing you a problem you are reminded that — "Advice on all types and aspects of interference (PLI, TVI, AFI, etc.) is available from the National EMC Advisory Service".

## FORWARD DETAILS TO

VK3QQ,  
Federal EMC Co-ordinator, QTHR.

## SILENT KEYS

It is with deep regret that we record the passing of —

Mr. G. A. WALDOCK VK2QU  
Mr. C. R. PITMAN VK6NFJ  
Mr. F. E. BLACK VK5AFB  
Mr. B. A. V. ELLIOTT VK5AVE  
Mr. G. J. ROYD VK2AML

## OBITUARIES

GEORGE WALDOCK VK2QU  
George Alexander Waldoock VK2QU passed away in Lithgow District Hospital on 15/6/81, aged 66 years.

George was born in Lithgow and left school at 14 to enter the mining industry at Lithgow Valley Colliery. He obtained his call in 1934 and became skilled enough in the radio field to teach at the Australian Radio College after a move to Sydney in 1938.

George served with the AIF in World War 2, after which he held the position of broadcast engineer at Radio 2WG Wagga.

George and his family returned to Lithgow in 1950 and during the next three years, until his health failed, worked at the State Mine, Lithgow Valley Colliery as Radio Station 2LT.

George's station was substantially home-brew and over the years he worked an impressive amount of DX using his transmitter which had an 813 final feeding to a zep antenna.

Although George did not enjoy good health for his final 12 years, he was always willing to help any aspiring amateur, and it was in this activity that I became privileged to meet George in 1977, when he cheerfully assisted me to obtain enough CW to pass my novice call.

I am sure all my fellow amateurs who met George on the air over the years will join me in extending condolences to his wife, Ena, and his family.

Yours faithfully,

N. R. Whipp VK2BYO.

B. A. V. (TIM) ELLIOTT VK5AVE  
Bruce (Tim) Elliott, late of Port Lincoln, South Australia, a man with a fine community spirit, has passed on at the early age of 55 years, on 24th May, 1981.

During the last war he joined the army at 16 years of age and was promptly discharged. He later joined and served in the RAAF.

Among his many interests, he served as a Scout leader and attended a jamboree. He was a member and Secretary of the Motor Cycle Club, a player with the Tasman Football Club and, later, a Colts trainer. He was a member of the Pigeon Club and a surf lifesaver.

Tim was a foundation member of the Port Lincoln Game Fishing Club, and the foundation secretary of the Lower Eyre Peninsula Amateur Radio Club and an active member of WICEN.

He joined the WIA in January, 1972, and obtained his novice licence on 16th November, 1978, as VK5NEB. A little later, he obtained his limited licence as VK5ZEV, being very active on 2m.

In August, 1978, Tim sat for and passed the AOCIP and received the call of VK5AVE. Tim was an enthusiast in everything he tackled. For example, after acquiring his novice licence, he was heard to say that he would throw away his key. Subsequently he became a member of VKCW QRP Club, member No. 30.

Each year Tim was very active in JOTA, no doubt due to his earlier interest in the counting. Tim leaves a wife, three sons and three daughters, and will be sadly missed by his family, his friends, members of LEPAIC, members of his community and a wide circle of amateurs.  
Inserted by VK5ET.

# HAMADS

- Eight lines free to all WIA members.
- 28 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Repeats may be charged at full rates.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTH means address is correct as set out in the WIA 1975 Call Book.

## FOR SALE

**Kenwood TS120V Txcvr.**, as new, little used, \$475, VK7TA, QTHR, Ph. (02) 34 5562.

**Yaesu FT200 Txcvr.**, incl. FP200 mains supply and speaker, also includes mic, crystals installed for 28.25 MHz, orig. carton and handbook, \$300, ONO. Rob Jennings VK3AVJ, Ph. (03) 786 8067 home, (03) 792 0531 work.

**Antenna Mast**, 2 section 57 ft. telescoping tilt-over hot galv. steel lattice mast, \$180. Pick up from Beverly Hills, VK2AOU, QTHR, Ph. (02) 53 9789.

**Yaesu SSB Filter** to suit FT401 series, type XF-3, freq. 3180 Kc, new, \$15; Grundig grid dip oscillator, 240V AC, 1.7 MHz to 250 MHz, good cond., \$35; two Marconi V322A solid state cameras, good cond., with manual and circuits, with lens, \$55, without lens, \$60, spare vidicon, \$10, first to buy gets manual; Gelsco CW tx., 80-10m, 813 final and spare tube, fully metered, good cond., \$70, Ph. (03) 725 9185.

**Kenwood TS120V**, exc. cond., no mods., in orig. cartons, with handbooks, service manual, MC355 mic., SP120 speaker and MB100 mobile mount, \$500, Ron VK2VGE, QTHR, Ph. (042) 29 4480.

**Yaesu FT75B Txcvr.**, 3 xials on each band, DC and AC matching power supplies, plus manual, \$450, ONO; Yaesu FT227RB 2m txcvr., plus manual, \$280, ONO; Trio BR-59D communications Rx., plus manual, \$200, ONO. All serious offers considered. VK2NTY/VOC, QTHR, Ph. (080) 5285.

**Yaesu FT101B**, good cond., in orig. carton, \$500, ONO; Kenwood TR7400A, 2m FM 800 ch. 25W, good cond., in orig. carton, \$300, ONO, Ph. (02) 218 4945 (BH), ask for Peter.

**Icom IC22A**, complete with mobile bracket, manual and fitted with repeaters 2 to 8, simplex 40, 50 and 1160; Icom IC22S, as new, still in box, \$290, David VK3ZSV, Ph. 596 3968.

**Kenwood TS520S**, as new, orig. packing, instruction manual, Turner desk mic. VK2LX QTHR, Ph. (043) 92 2390.

**Icom 211 Txcvr.**, 144-148 MHz, FM/SSB, dual VFO digital readout, AC/DC, base/mobile, as new, \$495, ONO; ARX2 Ringo 2m antenna, \$35, ONO; Ico 5520, ONO, VK2DJB, QTHR, Ph. (02) 634 2451.

**TH3JNR Tri-band Beam**, very functional, installation and operation instructions included, \$120, VK3GP, Ph. (03) 598 4504.

**Txcvr.**, Swan 550C, exc. order, with VOX, calibrator, complete set of new spare valves, spare mic., manual, \$300, VK2CE, QTHR, Ph. (02) 871 7758.

**IRC Coupons**, 35c each or 30 for \$10, s.a.s.e. please, VK6NE, QTHR, Ph. (09) 446 3232.

**AX190 Ham Bands Rx.**, perfect order, in orig. carton, with instruction book, circuit diagram, \$135; Icom 202 BHF SSB txcvr., same cond., \$140; Heathkit TV sweep and marker generator, good order, \$160, D. C. Sialler VKCJA, QTHR, Ph. (052) 31 4716.

**Ham Shack**, Clean-out: 803s and bases in g.c., various tension transformers, assorted output valves, valve tester, 2 Roll to turn com. speakers, 12 in. small variable capacitors suit VHF, will trade for 6m gear or sell. Mal VK3NCE, 2 Thornton Ct., Mooroolbark 3138, Ph. (03) 726 8752 AH.

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**Yaesu FT200 Txcvr.**, mic., PS200 power supply and speaker (110V), DC200 12V power sup., manual, home spares, few hours, good cond., \$410, VK4AQU, QTHR, Ph. (071) 45 1714.

**Kenwood TR9000** 2m all-mode Txcvr., \$460; Siemens model 100 teleprinter, complete with tape perf. and reader, this unit is in perfect cond., with manuals, \$275; XITEX ASCII baudot, 100 baud, \$180; \$15000 TV and demod., \$200, Ian VK2ZAV, QTHR, Ph. 053 2341 AH, 888 1133 Bus.

**Quartz 16 FM 2m Txcvr.**, 16 sets xials, new cond., 150, or swap for HF mobile unit, cash adjustment as necessary, VK3ABZ, QTHR, Ph. (02) 451 1313.

**Yaesu 101E**, used mainly as Rx., as new, instruction manual and all leads, orig. packing, house renovations more important, \$600, ONO, VK2NAZ, Ph. (048) 21 6272.

**Drake SSN-1 Communications Rx.**, \$600; Kenwood KP-202 2m txcvr., hand-held, ch. 2, 3, 4, 5, 6, 7, 8, simplex 40, \$0, \$100, Edward VK2CAQ, Ph. (062) 70 6240 BH, (052) 88 5609 AH.

**Antenna Rotator**, Archer (Stella) type, good cond., with indicator and good length cable, \$80, Arthur VK3JL, 130 Ballarat Road, Creswick, Ph. (053) 45 2031.

**Kenwood TV-502 Transverter**, unused, solid state, 150W, OBO, Paul VK4SY, Ph. (07) 57 7756.

**Daiva Rotor DR-500** with DC-7000 control box, all complete, very good cond., 150. John Breton VK5NHB, QTHR.

**Kenwood 7400 25W synthesized VHF Txcvr.**, professionally classed with end c/w cradle, mic., \$280; Kenwood 5203 HF txcvr., built built-in PSU and AC/DC converter, exc. order, \$500; Yaesu FT2 auto AC/DC VHF FM scanning txcvr., simplex AB 40, 50, repis, 1 to 8, mobile bracket, v.g.p., no further use, \$200, VK3GM, 15 Wendouree Parade, Ballarat 3350.

**JIL SX200 Scanning Rx.**, 26-58 MHz, 58-88 MHz, 180-180 MHz and 380-514 MHz FM and AM, 16 programmable memories, \$395; 2 Courier high band VHF FM txcvr., unmodified, \$400, each VK2KPK, QTHR, Ph. (049) 94 9267.

**Icom IC-211 SSB, CW, FM, 144-148 MHz txcvr.**, unmarked cond., very little use, \$700; Heathkit HW-8 QRP CW txcvr., with AC PSU, \$200; Tech TE-202 sp. gen., 120 kHz-500 MHz, \$50; Philips 1676 carphone, 53.032 MHz AM, \$20, valves, one of each, new unused, \$12 \$15, \$30B \$5, Ph. Edward (03) 439 1527 after 7 p.m.

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**Computer:** 2116C Hewlett Packard with raytheon computer and 1521 resolution, plus C/A multi-ported by H/P; IBM M72C magnetic card typewriter assorted books and service manuals on above; may be possible to get into or great for parts, make an offer; Yaesu FR100B Rx with matching FL100B Tx., all in working order, \$300, ONO, VKANOD, QTHR, Ph. (077) 43 5668.

**Yaesu FTV505 Transverter**, \$165; Icom IC22 2m FM, Ch. 3, 5, 6, 8, 40, \$130; Yaesu 2m txcvr., \$12; VTVM \$30; L5011 sp. gen. FET-ised, \$15; trans-former, 600V/485V per side 250 mA, 105 V 72 mA, 13V 4A, \$30; GDO Tech 4.280 MHz, \$12; Vortex cassette tape deck, \$10; Plessey B47 txcvr., tunable 38-55 MHz FM with circuit and homebrew linear, \$20, VK2ZHR, QTHR, Ph. (049) 45 9373.

**Yaesu FT400R** 2m all-mode, 1 month old, plus 2m 10 el. yagi, incl. 15m of coax, the lot \$500, VK3BJK, Ph. (057) 21 5823.

**Transformer**, 135-0-1350V at 1 amp, suitable for big linear amplifier, 400, ONO, VK3XU, QTHR, Ph. 725 0824.

**TS202S** with 500 Hz CW filter, DC-DC converter and ext. VFO 820, all unblemished, no mods. and fully up to spec. (same reason - house purchase), \$865 the lot, Tim VK3BGN, Ph. (03) 370 6092 AH.

**Yaesu FT101E Txcvr.**, v.g.c., full power, all bands, 15 0to 10m, includes full coverage, CB band, fan, processor, CW filter, mic., battery cables and instruction manual, Ph. (03) 570 4610.

**Drake TV3300 Low Pass Filter**, 1 kW, as new, \$35, two 40m Reyco antenna traps and W2AU 1:1 balun, all 30 unused, \$50, VK2BKE, Ph. (065) 52 2261.

## WANTED

Two 3 or 4 in. Dials for 1/4 in. shafts, while preferred similar, good cond. essential, VK2BKE, Ph. (065) 52 2261.

**Service Manual** and/or circuit diagram for Philips CRO, type TA155, VK3SV, QTHR, Ph. (03) 80 2330.

**Ex RAARF Radar Stations WW2 List Personnel**, all materials, addresses if available, particularly 300 series stations, also forward interesting experiences, anecdotes for possible publication or reunions via Radar Association. Write Laurie Peasley VK2BLP, QTHR, or Norm Smith VK3AUV, QTHR.

**Circuit**, or handbook, or information for AWA CRO type IA56031 RB L50536, Ph. (065) 68 2053 AH.

**Crystals Repeater** 2 146.100 Tx, 146.700 Rx, to suit Ken KP202 2m hand-held. VK2KPK, QTHR, Ph. (049) 94 9267.

**Video Tape**, 1 in., on 8 in. pool, with NAB hub, VK3BQ, Ph. (058) 21 9458.

## EXCHANGE

**Crystals (HCBU)** 3536 3550 3565 3568 3600 kHz, for crystals on top end of 80m or on 160m, VK3SV, QTHR, Ph. (03) 80 2330.

## TRADE HAMAD

**Ham, CB, Military Disposal Sale:** MLA2500 linear amp with large front panel, 2000W power output meter, 1.8 to 30 MHz, AM, SSB, CW, RTTY, SSTV, VFO; FRGT rx, 500 kHz to 30 MHz, \$275; ex RAARF Pyle aircraft transceiver, 110 to 140 MHz, \$45; HF FX20 transceiver, \$250; new W65 18 ch. SSB CB radio, \$170; new W65 40 ch., \$195; 18 ch. walkie talkie, \$110; 40 ch. CB with scanner, \$99; 23 ch. CB, \$55; 18 ch. CB, \$69; 27 and 28 MHz 4 el. beam, \$75; helical ant., \$8.50. Different rigs coming in each day. When in Sydney drop into Park Disposables, 32 Park Street, Sydney, 2000, near Town Hall Railway, Ph. (02) 264 7515. 18 ch. SSB CB anywhere in Australia, NZ, PNG, Pacific add \$5.

**Amidon Ferroamagnetic Cores:** Large range for all RF receiver and transmitter applications. Closed during November. Send large SASE for data and price list to: R.J. & U.S. Imports, Box 157, Mortdale, NSW 2223.

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## YAESU THE RADIO

Introduces the ultimate professional  
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### ● GENERAL COVERAGE

The model FRG-7700 is a high-performance, all solid state, communications receiver designed to cover the low, medium and high-frequency spectrum from 0.15 MHz to 29.999 MHz.

### ● ALL MODE CAPABILITY

A unique feature of the FRG-7700 is its all mode capability — SSB (USB, LSB), CW, AM, and FM. The FM mode is especially useful when the FRG-7700 is teamed with a VHF converter.

### ● DIGITAL FREQUENCY/TIME DISPLAY

The FRG-7700 digital display unit allows you to display the operating frequency or time. Just turn a knob for selection of the desired function.

### ● TWELVE MEMORY CHANNELS (OPTION) WITH BACKUP

As many as twelve memory channels may be programmed for instant return to a favourite station. The memory unit stores the entire frequency, which means you never have to change the bandswitch when switching channels. A backup feature is provided to hold the memory circuits when the FRG-7700 is turned off.

### ● LSI CLOCK TIMER

If you want to record a program, but have to be away from your station, the FRG-7700 will do it for you. The built-in digital quartz clock contains a timing feature that activates the receiver and internal relay contacts. Set the time you want to start and stop recording, hook up your tape recorder, and your FRG-7700 will do the rest.

### ● WIDE DYNAMIC RANGE

The FRG-7700 is an up-conversion superheterodyne receiver, incorporating a 48 MHz first IF. The up-

conversion technique and the individual filter networks in the front end eliminate most image problems, allowing you to receive weak signals. A high "loss" JFET balanced mixer is utilized in the FRG-7700 to provide wide dynamic range for protection from cross modulation.

### ● CONVENIENCE FEATURES

Selectable AGC, memory fine tuning, DIM switch for dimming the digital display, advanced noise blanker, and a variable RF attenuator provide the convenience you need for efficient operation. The front panel controls and switches are arranged in a logical manner, so you won't have to fumble for a knob when you need it quickly.

Extend the capabilities of the FRG 7700 with the FRT 7700 Antenna Tuner, the FF 5 Low Pass Filter and the VHF Converter FRV 7700

FRV 7700 MODEL	BAND 1 mHz	BAND 2 mHz	BAND 3 mHz
A	118-130	130-140	140-150
B	118-130	140-150	50-60
C	140-150	150-160	160-170
D	118-130	140-150	70-80
E	140-150	150-160	118-130
F	150-160	160-170	118-130

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